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Technical Review of the Economic Development Conveyance Application for the Detroit Arsenal Tank Plant, Warren, Michigan

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In 1993 President Clinton requested that Congress provide new authority to expedite the reuse of military bases adversely affected by Base Realignment and Closure (BRAC) actions. The result was a new property transfer method, called an Economic Development Conveyance (EDC), which gives greater flexibility to the Department of Defense (DoD) and affected communities to negotiate a mutually beneficial property transfer.

On 2 July 1997, the City of Warren, MI, filed an EDC application for transfer of the Detroit Arsenal Tank Plant, a U.S. Army installation slated for closure under BRAC 95. The U.S. Army Construction Engineering Research Laboratories was tasked by Headquarters, U.S. Army Corps of Engineers to (1) review the EDC application for compliance with DoD rules implementing the Federal EDC policy, (2) analyze the findings, and (3) report to the sponsor.

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In 1993 President Clinton requested that Congress provide new authority to expedite the reuse of military bases adversely affected by Base Realignment and Closure (BRAC) actions. The result was a new property transfer method, called an Economic Development Conveyance (EDC), which gives greater flexibility to the Department of Defense (DoD) and affected communities to negotiate a mutually beneficial property transfer. On 2 July 1997, the City of Warren, MI, filed an EDC application for transfer of the Detroit Arsenal Tank Plant, a U.S. Army installation slated for closure under BRAC 95. The U.S. Army Construction Engineering Research Laboratories was tasked by Headquarters, U.S. Army Corps of Engineers to (1) review the EDC application for compliance with DoD rules implementing the Federal EDC policy, (2) analyze the findings, and (3) report to the sponsor.

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Executive Summary

Adverse Economic Impact of the Closure on the Region and the Potential for Recovery After the EDC (Chapter 1)

USACERL's analysis generally failed to support the closure impacts and potential for recovery suggested by the EDC application for the Detroit Arsenal Tank Plant (DATP). In particular, USACERL determined that total likely detrimental impacts will probably amount to about 346 jobs, or just under $45 million in gross output, rather than the 5,000+ referred to in the EDC application (a discussion of lost gross output was not provided in the EDC application).

USACERL's estimates varied from those presented in the EDC application primarily because of two apparent methodological shortcomings in the calculation approach used by the EDC application. First, the inclusion of preclosure downsizing effects in the closure impact analysis, including the economic impacts of preclosure downsizings occurring up to a decade before the closure, was inappropriate. Secondly, the choice of an overly small region of impact (ROI) was deemed incorrect because it neglected important regional economic interrelationships and thus incorrectly amplified estimated local impacts. USACERL's estimates corrected both of these limitations.

Extent of Short- and Long-Term Job Creation (Chapter 2)

USACERL's analysis of potential long-term job creation suggests that between 5,900 and 9,600 jobs will eventually be created as a result of redevelopment. Note, however, that these projections are based on the assumption that absorption of redeveloped space will be complete by either 2001 or 2004, and the assumption that employment densities will approximate one employee for each 550 square feet of space; other specific assumptions were also made. These projections suggest that total closure impacts (as calculated by USACERL) will be fully mitigated by the second year of the redevelopment.

USACERL's analysis failed to support the job creation estimates advanced by the EDC application. Specifically, the EDC application suggested that a maximum of approximately 3,200 jobs will be created, and that total impacts (as

calculated by the EDC application) will not be fully mitigated during the redevelopment timeline. USACERL's review of the methodology used in the application revealed that it completely failed to consider significant indirect and induced job-creation effects that would have the effect of dramatically reducing projected job creation estimates.

EDC Application's Consistency With the Overall Redevelopment Plan (Chapter 3)

The DATP EDC application is generally consistent with the DATP Comprehensive Reuse Plan. In particular, the EDC application soundly responds to the economic development goals of the reuse plan by proposing a strategy which is based on industrial, research and development (R&D), and commercial uses. However, USACERL noted deficiencies in the applicant's capital improvement program relative to apparently inconsistent capital costs, shallow improvement descriptions, and improvement locations. This constraint was further magnified by the fact that private sector investment in site utilities and infrastructure is unknown.

USACERL also reviewed for consistency a number of proposals submitted under the Local Redevelopment Authority's (LRA's) redevelopment request for proposals (RFP). Review of the proposals revealed that they were generally consistent with the DATP Reuse Plan, and in some instances exceed articulated goals and objectives. However, other than the programmed reuse of Building 4, it was unclear to USACERL what on-site capital improvements would be the responsibility of private sector developers.

Business Plan Review and Market and Financial Feasibility Analysis (Chapter 4)

The City of Warren requests conveyance of the EDC parcel (153 acres of land and all improvements with 1.4 million sq ft of building space) at no cost (i.e., 100 percent discount). The applicant's reuse plan is based on the demolition of most existing buildings and infrastructure improvements in order to create a flexible industrial and R&D park. Key components and assumption of the plan include the following:

- no reuse of existing facilities or buildings
- 120 acres of land available for sale for future R&D/industrial development
- 1.4 million sq ft build out potential based on a 0.35 floor area ratio (FAR)

- 30 acres of land for future commercial development targeting entertainment/ recreational uses, specifically a multi-cineplex
- all developable land sold between 1998 and 2004
- industrial land sold at $3 per sq ft or $130,680 per acre, for total 7-yr revenues of $18.8 million
- $20.2 million in on- and off-site capital improvements programmed between 1998 and 2002.

The business plan's net present value (NPV) ranges were calculated using three different perspectives, which considered:

1. The LRA's total project view, which includes all $20.2 million proposed on- and off-site capital improvements

2. Project analysis using USACERL/BAE*-developed capital improvement costs of $16.2 million

3. Project analysis using USACERL/BAE-developed capital improvement costs of $16.2 million, but including $6 million in grant funding offsets.

Applying discount rates of 15 and 12% to projected annual income streams (with a 4% per annum nominal inflation factor), the calculated NPV ranges for each perspective above, respectively, were:

1. -$7.1 million to -$6.5 million (negative NPV, considering all $20.2 million in proposed capital improvements)

2. -$2.5 million to -$1.7 million (negative NPV, considering USACERL/BAE capital costs of $16.2 million)

3. $2.9 million to $3.8 million (positive NPV, considering USACERL/BAE capital costs of $16.2 million and $6 million in grant funding)

USACERL and BAE developed an alternative scenario which is reflective of current market interest in the site. Unlike the LRA scenario, which programs the demolition of all existing buildings and infrastructure improvements, USACERL's and BAE's alternative scenario includes the reuse of the 1.1-million-

* USACERL/BAE = U.S. Army Construction Engineering Research Laboratories/Bay Area Economics.

sq-ft Building 4, consistent with a majority of the development proposals solicited under the LRA's RFP process. An additional two scenarios were developed under this project assumptions and include: (1) increased land revenues and (2) environmental encumbrances which extend projected absorption. The CERL1 alternative scenario was based on the following assumptions:

- Building 4 is reused as an industrial facility, with the LRA contributing $6.8 million in tenant fit-up costs
- Property absorption is accelerated from 7 to 4 years based on development proposal phasing
- 4-yr project revenues total $19.6 million and include leasing Building 4 in 1998
- 4-yr operating costs total $1.2 million.

The discounted cash flow analysis for CERL1 produced the following NPV ranges for two project perspectives:

1. -$1.9 million to -$1.8 million (negative NPV, considering all CERL1 assumptions)

2. $3.4 million to $3.7 million (positive NPV, considering all CERL1 assumptions plus $6 million in grant funding offsets).

CERL2 used the same assumptions as listed for CERL1, but land sale revenues were increased from $19.6 million to $21.5 million based upon accelerated absorption. In addition, because operating costs are tied to land revenues, operating costs increase from $1.2 million to $1.3 million. The discounted cash flow analysis for CERL2 resulted in calculated NPV ranges as follows:

1. -$585,573 to -$337,755 (negative NPV, considering all CERL2 assumptions)

2. $4.7 million to $5.1 million (positive NPV, considering all CERL2 assumptions plus $6 million in grant funding offsets)

CERL3, like CERL1 and 2, proposed the reuse of Building 4. However, building absorption is extended to 2009 for a 12-yr development horizon as a result of potential environmental encumbrances. Total 12-yr revenue and operating costs are projected to be $20.2 million and $1.5 million, respectively. The discounted cash flow analysis for CERL3 produced the following NPV ranges:

1. -$3.9 million to -$3.2 million (negative NPV, considering all CERL3 assumptions)

2. $1.3 million to $2.2 million (positive NPV, considering all CERL3 assumptions plus $6 million in grant funding offsets).

It is the conclusion of USACERL and BAE that the LRA's business plan is financially feasible under a range of scenarios when grant funding offsets are applied to capital costs. Because of the degree of uncertainty and absence of all required technical review information, USACERL and BAE also conclude that it is not reasonable to recommend a final range of project NPV until such information is made available for further analysis.

Need and Extent of Proposed Infrastructure Improvements (Chapter 5)

The City of Warren estimates that it will need to invest about $20.2 million in capital improvements to bring DATP up to a marketable, code compliant, and functional level. Of that total, the $8.7 million building demolition cost estimate was found to be overstated. USACERL developed an alternative cost estimate of $3.3 million, which partially reduced total site preparation costs from $11.6 million to $9.7 million. It should be noted, however, that USACERL experienced particular difficulty in terms of validating the LRA's costs for parking lot demolition and site seeding and planting because of a lack of appropriate assumptions, measurements, and project descriptions. In an attempt to validate these costs, USACERL relied upon professional experience and industry standards to develop costs of $3.4 million and $1.5 million for parking lot demolition and seeding planting, respectively (LRA costs were estimated at $1.2 and $450,000). USACERL's final range of capital costs under Strategy 1 was estimated to be $12.3 million to $16.2 million.

USACERL also developed an alternative strategy based on the development proposals received under the City of Warren's RFP. The key assumptions change in Strategy 2 is the reuse of the 1.1-million-sq-ft Building 4, with building fit-up costs of $5.7 to $6.8 million. Total estimated capital costs under Strategy 2 range from $15.9 million to $20.6 million, which captures the LRA's estimate of $17.1 million.

Extent of State and Local Investment and Risk (Chapter 6)

Under redevelopment Strategy 1, the LRA proposed four major categories of capital investment: (1) building demolition, (2) on-site utility demolition, (3) new on-site utility and road improvements, and (4) miscellaneous on- and off-

site costs. Strategy 2 proposes building fit-up as an additional category of investment.

The applicant proposed $20.2 million and $17.1 million in capital improvement investment under Strategies 1 and 2, respectively. Both strategies, although vague in details, should go a long way toward achieving the job creation goals through the development of a flexible industrial and R&D park. However, Strategy 2 appears to carry more long-term risk in terms of sustained long-term job creation and increasing site value. This risk is fundamentally a result of the reuse of Building 4, which could pose potential problems in terms of marketing, operating costs, and tenant turnover.

Another key component of state and local investment is the substantial tax benefit accrued to private sector end users who locate in DATP's Renaissance Zone. The Renaissance Zone for DATP was created by the State of Michigan for a duration of 15 years, with the intent of attracting high-quality investment which leads to the creation of well-paying jobs. The LRA estimated that 15-yr benefits could total nearly $30 million depending on property absorption, types of industries, and employment. An alternative view of these lost revenues is as an additional investment in DATP of nearly $30 million by the state and City of Warren to promote job creation, rapid redevelopment, and quality end users.

Project risk was divided into three categories: (1) economic, (2) political and organizational, and (3) environmental. Economic risk is judged to be moderate based on projected operational shortfalls calculated in the LRA's business plan, which, in the absence of additional revenues, could likely result in the failure to fund capital investments, slowing absorption, and further affecting financial feasibility. However, economic risk may be partially offset by capital improvement subsidies of nearly $6 million originating from the Renaissance Zone program and the Economic Development Administration (EDA). Economic risk may further be reduced by the strong demand indicated for the EDC parcel as shown by RFP response. Political and organizations risk stems from the fact that the applicant rejected all 11 development proposals submitted under the RFP and the remote possibility that the Army might not be able to convey a portion of the EDC parcel by 31 December 1997 (the state's deadline for continuance of Renaissance Zone benefits). Finally, environmental risk is associated with the ability of the Army to transfer environmentally encumbered parcels consistent with business plan absorption schedules.

Local and Regional Real Estate Market Conditions (Chapter 7)

USACERL's review of market conditions generally supported the conclusions reached by the EDC application with respect to local real estate markets. USACERL's independent market analysis findings suggest that the Warren-area industrial real estate market is fairly robust and unlikely to present a limitation to redevelopment. In particular, recent demographic and economic trends, when combined with trends in the local real estate market, indicate that demand for industrial space will likely continue steadily for the foreseeable future.

However, USACERL also cautions that the uniqueness (particularly the size) of the DATP facility in comparison to other available industrial properties necessarily limits estimates about future sales value. Although USACERL was able to generate an estimate for potential lease rates, estimates about potential sales values were simply too speculative to be useful. Therefore, it is USACERL's conclusion that the redevelopment and marketing of the DATP facility faces a moderate amount of market risk.

Army's Disposal Plan, Other Federal Agency Concerns, and Other Property Disposal Authorities (Chapter 8)

As part of the EDC review process adopted by the BRAC office at HQUSACE and presented at the Corps of Engineers Real Estate Workshop in Denver, CO, in December 1995, USACERL has been asked to defer comment on these issues to the Real Estate Directorate at HQUSACE and the Corps of Engineers District, Louisville. In addition, both the negotiation process leading up to the submittal of the formal EDC application and review of the legal environment related to real and personal property disposal are beyond USACERL's scope of technical review.

Economic Benefit to the Federal Government (Chapter 9)

Without a timely conveyance of the EDC parcel after all Army uses for the property cease, USACERL assumed that the Army would be compelled to mothball or "layaway" the facilities and infrastructure, except for those retained by the Federal Government. The one-time facility layaway cost for DATP is estimated to be $481,500, while ongoing annual maintenance and repair costs are estimated at roughly $1.2 million.

While a timely conveyance would allow the Army to avoid these costs, based on the technical findings of Chapter 4, the applicant's proposed consideration to the Army of $0 is inadequate. USACERL was able to independently support a range of project NPVs from *negative $3.9 million* to *positive $5.1 million*. It should be noted, however, that under USACERL's scenarios, positive project NPV was only achieved when grant funding was applied to capital costs programmed in 1998 and 1999.

Based on the eligibility factors/criteria reviewed for this report, it is the opinion of USACERL that the applicant is eligible for an EDC so long as proposed capital investments do not decrease as a result of developer and investor interest in the EDC parcel. However, USACERL cannot find support for a discounted conveyance based on the economic impact from the closure and potential for recovery (see Chapter 1). The Army's final determination of value and possible consideration must rest largely on the results of a negotiation process between the Army and LRA and the Army's fair market value appraisal results. If a discount is deemed appropriate based on other review factors, the Army should consider probable layaway and O&M costs savings of nearly $1.7 million, or the LRA's proposed level of capital investment to promote job creation.

Review of Application for Completeness (Chapter 10)

The City of Warren's EDC application was found to be generally complete with two notable exceptions. First, although a discussion of the economic impact of the closure was included, it was marked by methodological errors and gaps in source data which complicated USACERL's review. Second, a cost estimate and justification for infrastructure was included, but was found to be generally unsatisfactory by USACERL. Proposed capital improvements were found to be vague and generally lacking the detail usually observed with other EDC submissions. USACERL's review was further complicated by the fact that proposed capital improvements could change in light of strong market demand for the EDC parcel.

Foreword

This study was conducted for the Base Realignment and Closure Office, Headquarters, U.S. Army Corps of Engineers, and funded through the BRAC Officer, Office of the Assistant Chief of Staff for Installation Management (ACSIM-DAIM-BO), under Military Interdepartmental Purchase Request (MIPR) 7ACERB3001, dated 10 October 1996. The technical monitor was Gary B. Paterson, CERE-C.

This work was performed by the U.S. Army Construction Engineering Research Laboratories (USACERL), Planning and Management Laboratory (PL), and Facilities Technology Laboratory (FL). In addition, the real estate consulting firm of Bay Area Economics (BAE) was retained by USACERL to assist with required market and financial analyses. Michael Golish is Operations Chief, PL and Interim Operations Chief, FL.

Jeffrey J. Bogg, PL-N (EDC Project Leader, Consistency with Reuse Plan, Economic Benefit to the Federal Government); Anita Morrison, BAE (Business Plan Review and Market and Financial Feasibility Analysis); Jonathan Stern, BAE (Business Plan Review and Market and Financial Feasibility Analysis); Jane DeRose, PL-N (Infrastructure Analysis Coordinator); Jeffrey G. Kirby, PL-E (Need and Extent of Infrastructure Improvements); Aaron A. Freeman, PL-N (Economic Impact Analysis, Job Creation); Dahtzen Chu, FL-E (Need and Extent of Infrastructure Improvements); Samuel L. Hunter, FL-P (Need and Extent of Infrastructure Improvements); Todd VanVoast, PL-N (Building Improvements); and Linda L. Wheatley, TR-I, was managing technical editor.

Also acknowledged for their contributions are Richard Schneider (PL-N), Don Kermath (PL-E), and L. Jerome Benson (PL-N). This research was supported in part by an appointment to the Research Participation Program at USACERL administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and USACERL.

COL James A. Walter is the Commander of USACERL, and Dr. Michael J. O'Connor is Director.

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Introduction

Background

The Detroit Arsenal Tank Plant (DATP) Economic Development Conveyance (EDC) parcel consists of approximately 147.5 acres and 1.4 million square feet of building space in Warren, MI, 7 to 8 miles north of downtown Detroit. Primary ingress and egress to the site is achieved by three curb cuts into Van Dyke Avenue, which serves as the eastern border of the site. Van Dyke Avenue intersects I-696, which eventually provides access to major national transportation corridors such as I-96, I-75, and I-94. The areas immediately adjoining DATP are predominately used by industry and the Army (a retained Tank-Automotive Command [TACOM] mission to the west of the site) along with some low-density residential development. Figures 1 and 2 (pp 21 and 22) show the site's market area and geographic relationship to key transportation corridors from regional and local perspectives, respectively. Figure 3 (p 23) shows DATP's present site plan.

On 2 July 1993, President Clinton announced a major new policy to speed the economic recovery of communities adversely affected by military base closures or realignments. The President requested that Congress provide additional authority to expedite the reuse of closing military bases, in an effort to create new jobs and reestablish the economic base. Congress provided this new authority (commonly called the "Pryor Amendments") and subsequent amendments as Title XXIX of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 1994. The Department of Defense (DoD) has recently codified the final implementing regulations for this legislation at 32 CFR 90-92, "Revitalizing Base Closure Communities." Collectively, these new rules are intended to facilitate the conveyance (transfer of military real and personal property) from the Federal Government to an approved Local Redevelopment Authority (LRA).

These regulations created the new EDC property transfer authority, which gives greater flexibility to the military departments and affected communities to negotiate the terms and conditions of the conveyance if specified criteria are met. When DATP was slated for closure by the 1995 Base Realignment and Closure

(BRAC) Commission, the City of Warren established the Local Reuse Committee (LRC) and subsequent LRA to facilitate the reuse and economic redevelopment of the surplus parcel. Since the 1995 announcement, the facility has essentially demobilized in preparation for disposal.

On 2 July 1997, the City of Warren, acting as the implementing LRA, filed an EDC application with the Chief of the BRAC Office at Headquarters, U.S. Army Corps of Engineers, for the conveyance of the surplus parcel at DATP. Included as part of the EDC application was a copy of the DATP Comprehensive Reuse Plan.

In general, the LRA has requested that the Army transfer the EDC parcel under the following general terms and conditions:

1. The Army will negotiate a Purchase Agreement covering all 147.5 acres of the EDC parcel, including land, buildings, storm water utility systems, roads, and related infrastructure and personal property by December 1997. Property deeds will be held in escrow until a finding of suitability to transfer (FOST) is found for formerly environmentally contaminated parcels.

2. The Army should consider a sale-leaseback for Building 7 and 8, which are scheduled to be retained by TACOM. The inclusion of these buildings would increase the EDC request to 153 acres.

3. The City of Warren requests a zero-cost conveyance.

The LRA's EDC application provides discussion of the required elements under the regulation, but elements of the business plan as presented are vague and perhaps subject to future programmatic change. The largest point of concern as identified by USACERL, was the LRA's capital improvement plan. The proposed capital improvement program was considered to be inconsistent and generally did not provide the level of detail usually present in other reviewed EDC applications. This problem was further magnified when considered within the context of a strong market demand for the EDC parcel. The City of Warren received 11 development proposals for all or part of the site as a result of its recently initiated request for proposals (RFP) process. Because of the strong demand for the site and uncertainty associated with public and private sector levels of investment, the Army must guard against a direct pass-through of the parcel to a developer with little investment made by Warren.

Subsequent to the receipt of the application by Headquarters, U.S. Army Corps of Engineers, the U.S. Army Construction Engineering Research Laboratories (USACERL) was tasked by headquarters to provide a technical review of the LRA application, evaluating it for compliance with 32 CFR Part 91 and related regulations. This report comprises USACERL's findings and conclusions.

Objective

The objective of this study was to technically evaluate the City of Warren EDC application in terms of:

1. validity of the information provided by the LRA, and

2. completeness of the application according to the criteria and factors specified in the DoD regulations governing EDCs.

The objective of this report is to document the study's findings, noting any deficiencies found in the application, and to attempt to address those deficiencies.

Tasking and Approach

Technical review of the LRA's EDC application was executed by a multidisciplinary work group formed and managed through the USACERL Planning and Management Laboratory (PL). In anticipation of the EDC application, the USACERL work group conducted site visits to DATP and the Detroit region from 9 July to 9 September 1997. The purpose of these visits was to coordinate the application review with DATP Army Caretaker Force personnel and to collect preliminary and follow-up data. Most of the group's analytical work and documentation occurred between 21 July and 12 September 1997.

Validity of the information provided on the EDC application was determined by following a protocol specifically developed to demonstrate how the substance of the application meets the criteria in the DoD implementing regulations related to EDCs. Using data provided in the EDC application and supporting documents, as well as data gathered independently by team members, USACERL evaluated the application according to the following criteria and factors.

1. adverse economic impact of closure on the region and potential for economic recovery after an EDC

2. extent of short- and long-term job generation

3. consistency with the overall Redevelopment Plan (i.e., the DATP Reuse Plan)

4. financial feasibility of the proposed development, including market analysis, and the need and extent of proposed infrastructure improvements

5. extent of state and local investment and risk incurred

6. current local and regional real estate market conditions in the affected area

7. relationship to the overall Military Department disposal plan for the installation, incorporation of other Federal agency interests and concerns, and applicability of, and conflicts with other Federal property disposal authorities

8. economic benefit to the Federal government, including protection and maintenance cost savings and anticipated consideration from the transfer.

Another criterion to be reviewed under the EDC implementing regulations is the proposed EDC's compliance with applicable Federal, state, and local laws and regulations. This type of legal review falls beyond the scope of USACERL's tasking and expertise, and is not addressed in this report.

After evaluating the validity of the information provided in the EDC application, USACERL determined whether the application was complete in terms of the seven criteria specified in the EDC implementing regulations. (These criteria are discussed in Chapter 10, **Review of Application for Completeness**.)

Finally, the USACERL work group compiled its findings into this report and a briefing for the sponsor. The final briefing was given to Army decision-makers on 18 September 1997.

Metric Conversion Factors

U.S. standard units of measure are used throughout this report. A table of metric conversion factors is presented below.

1 in.	=	25.4 mm		1 cu ft	=	0.028 m3	1 ft	= 0.305 m
1 sq ft	=	0.093 m^2		1 mi	=	1.61 km		

Figure 1. Detroit Metropolitan Area showing major transportation corridors and geographic relationship of DATP.

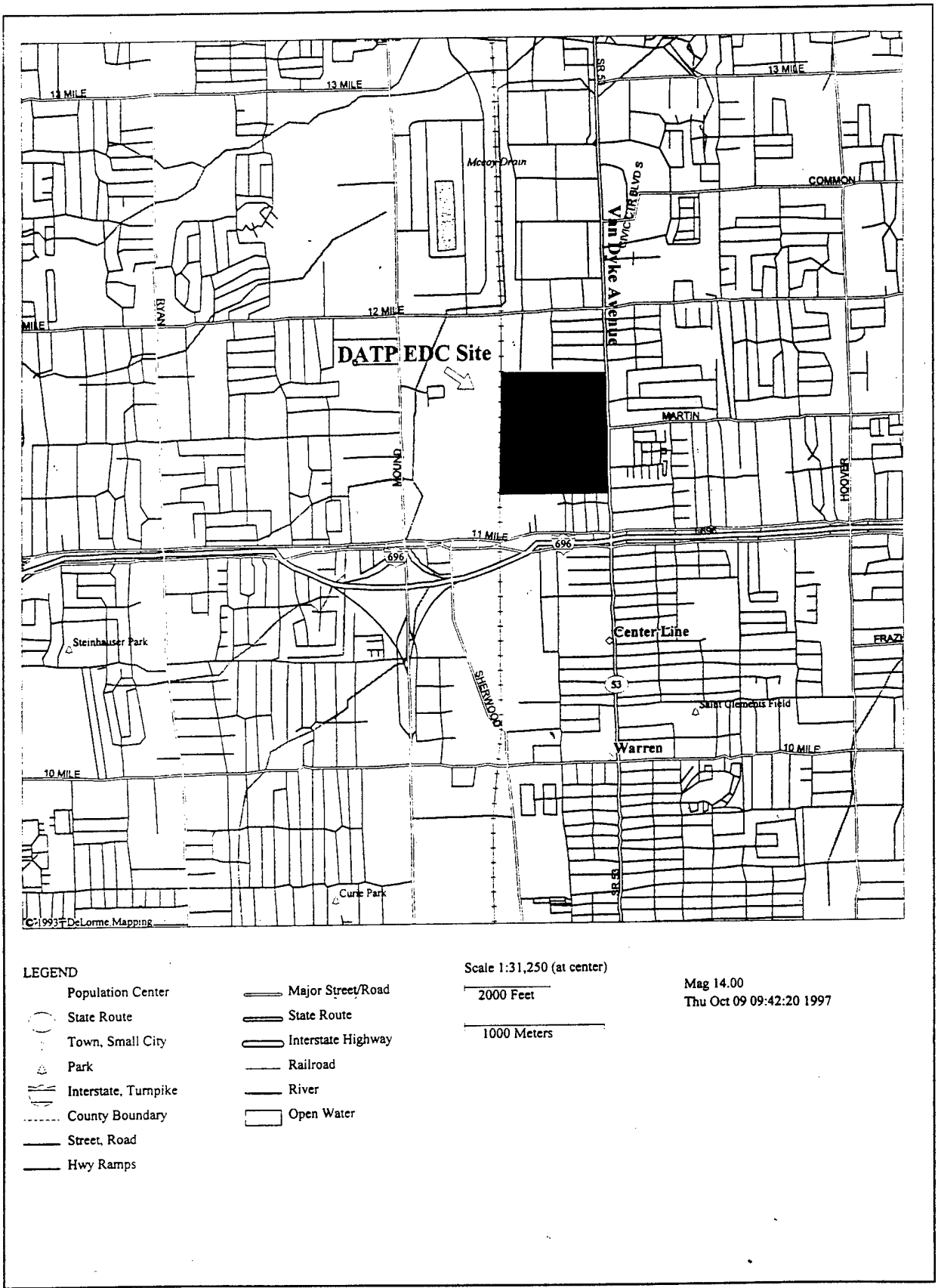

Figure 2. Secondary transportation corridors and geographic relationship of DATP.

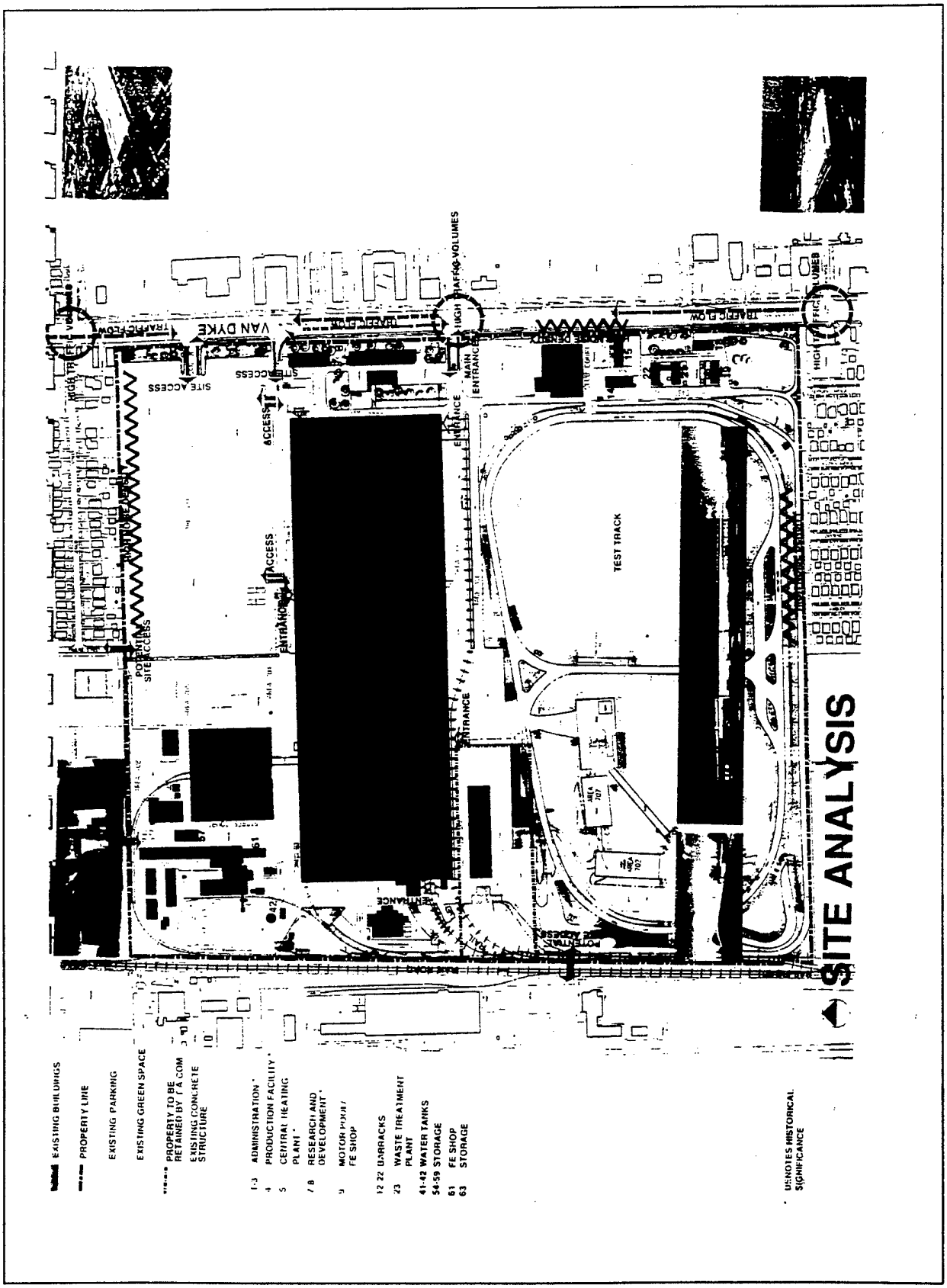

Figure 3. DATP site plan.

1 Adverse Economic Impact of the Closure on the Region and the Potential for Recovery After the EDC

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Background

Pursuant to 32 CFR §175, the prescribed content of the EDC application must include a description of the economic impact of a base closure on local communities. This chapter addresses these concerns by examining the extent of closure impacts and whether the proposed DATP EDC application will facilitate a recovery of lost jobs and revenues.

Methodology

To determine economic impacts from the closure of DATP, USACERL first reviewed the EDC application, the 2 May 1997 revised Reuse Plan, the U.S. Army Draft Environmental Assessment (DEA), and other referenced documents to determine the extent of the adverse economic impact experienced in the Detroit region as a result of the closure. USACERL found that, while these documents describe some of the adverse impacts that have resulted from the closure, they do not present a sufficiently comprehensive socioeconomic analysis of possible closure and reuse scenarios.

Accordingly, USACERL elected to use a two-part analysis for evaluating the DATP EDC application. For part one, USACERL examined the assumptions

and methodologies used to develop the impact estimates in the application for their internal consistency and appropriateness. For part two, USACERL developed independent estimates of the likely impacts of the closure. In developing these independent estimates, USACERL relied primarily on Implan Pro v1.1, a software program that uses a standard input-output modeling methodology to generate impact multipliers from county-level economic data. Implan Pro has been used extensively by private and public entities to quantify positive and negative economic effects that may result from a wide array of investment scenarios, including the closure of military bases.

Review of EDC Application Assumptions and Methodology

USACERL's review of the economic impact estimates presented in the EDC application suggests that these estimates suffer from at least two serious methodological shortcomings, both of which probably caused the impact estimates to be dramatically overstated. These limitations are delineated as follows.

Inclusion of Preclosure Impacts

The first weakness in the application methodology relates to the inclusion of both closure and preclosure impacts in the total impact calculations. Although the EDC application completely fails to provide a description of how its impact estimates were reached, it is apparent that preclosure impacts are included in total impact estimates because the application refers to employment levels that were present up to 12 years before the actual DATP closure.* For example, page 11 of the application explicitly states: "Nearly five thousand (5,000) jobs were lost in the years *preceding the official BRAC closure designation*"† (emphasis added). The application does not, however, attempt to discuss impacts sustained during or after the year of closure, nor does it attempt to segment the total claimed impacts into pre- and post-closure portions, or even the methodology used to generate closure impacts.

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* See EDC application, p 11, which states: "In 1983, the DATP was Warren's second largest employer..."

† See EDC application, p 11.

This practice contrasts with both the intent of available guidance documents and the typical way in which closure impacts have been quantified. The Code of Federal Regulations (CFR), for example, mandates the following:

> The following criteria and factors will be used, as appropriate, to determine whether a community is eligible for an EDC and to evaluate the proposed terms and conditions of the EDC, including price, time of payment, and other relevant methods of compensation to the federal government.
>
> - Adverse economic *impact of closure* on the region and potential for economic recovery after and EDC.
>
> - Extent of short- and long-term job creation... (emphasis added).*

Read plainly, this passage suggests that only impacts directly related to closure (or the BRAC closure announcement) be considered during the evaluation of an EDC, rather than impacts both from downsizings occurring years before closure and from post-closure.

Furthermore, the typical practice for calculation of closure impacts has been to use the population and expenditure levels present during the year of closure as the basis for all calculations. For example, the Office of Economic Adjustment (OEA) uses this practice for specific analyses as have other LRAs and most state and local agencies charged with assessing economic impacts. In all of these cases, the year of closure is typically chosen as the base year in order to isolate only those impacts related directly to the closure itself; choosing an earlier year would typically have the effect of capturing both closure and unrelated preclosure "downsizing" impacts.

Because of this inappropriate inclusion of preclosure impacts, USACERL finds that the closure impacts claimed in the EDC application are probably overstated.

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* See 32 CFR §175 or 59 FR 53735, 53738 (1995).

Choice of Region of Influence (ROI)

The second limitation in closure impact calculations presented in the EDC application relates to the fact that many of the estimates use only the City of Warren (or even the several-block radius surrounding just the base) as the area for economic analysis, or ROI.

It is important to realize that any given economic effect will almost never have the same boundaries as a city or county. The U.S. Census Bureau recognizes this fact, which is why the concept of a large "Metropolitan Statistical Area" was developed. Although the City of Warren does have specific boundaries, it is wholly surrounded by, and inextricably linked to, the large regional economy that encompasses the greater Detroit region. Accordingly, it is difficult to address the economic effects occurring in Warren without also examining and describing effects occurring in the surrounding areas.

The DEA also recognizes this fact, and defines an area that includes all of Macomb, Wayne, and Oakland counties as the "primary Region of Influence" (primary ROI). This region covers some 1,967 square miles, has a population of over 3.9 million people, and includes much of the Detroit metropolitan area. For the sake of comparison, the EDC application's ROI (the City of Warren) has a population of about 150,000 people.

Since the detrimental impacts of closure will likely be distributed throughout a region much larger than just the City of Warren, USACERL finds that the EDC application inappropriately focuses only on local impacts. Therefore, the relative significance of these impacts has probably been overstated in the EDC application.

Adverse Economic Impact of the Closure of DATP

After developing independent estimates of the closure impacts for DATP, USACERL was unable to confirm the estimates presented in the EDC application. Although the EDC application correctly notes that DATP was one of the larger employers in the three-county area, USACERL finds that actual closure impacts will probably be substantially lower than the estimates presented in the EDC application, and does not generally share the view that impacts at the DATP site have "significantly contributed to the deterioration of the Van Dyke Commercial Corridor both directly and indirectly."

Assumptions

USACERL's independent impact estimates relied on the following assumptions:

- Approximately 19% of employee's salaries and wages are paid to Federal and state governments in the form of taxes.*
- The consumption patterns of civilian employees and contractors are similar to the consumption patterns of other middle-class residents of the three-county region.
- The consumption patterns for all military personnel (i.e., at or above $30,000 per year gross income) were assumed to be similar to consumption patterns of other middle-income area residents.†
- Spousal employment patterns for DATP employees are similar to spousal employment patterns for the three-county ROI.
- "Employee compensation" includes all salaries and wages, as well as life and health insurance, pension payments, and any other non-cash compensation.

Findings

USACERL's independent analysis did not confirm either the absolute volume of closure impacts claimed in the DATP EDC application, or the economic multipliers that were used. Instead, it indicated that the total impacts associated with the closure of DATP will generally be only about 40 to 50% larger than the direct losses associated with the base closure itself, and that these direct losses will be fairly small. More specifically, USACERL found that, for each dollar spent directly on base activities, the surrounding communities will lose about $1.19 in total output, and for each job lost at DATP, the area will lose a total of about 1.37 jobs. Conversely, the EDC application suggests that total impacts will be some 10 times as large. USACERL's findings are consistent with similar findings presented in studies of short-term base closure impacts.‡ Note that short-term impacts will generally be the most obvious and

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* 19% is an approximate figure because some forms of taxation are difficult to measure directly; for example, vehicle licensing fees, service fees, or other similar municipal fees are economically similar to taxes, but can be difficult to capture using an input-output approach.

† Based on the total salary-related expenditures that occurred during the year of closure, DATP employees earned an average of $37,339 per employee.

‡ See, for example, National Defense Research Institute, "The Effects of Military Base Closures on Local Communities: a Short-term Perspective," MR-667-OSD (Rand Institute, February 1996).

pronounced, as the local economy stabilizes and clears excess capacity and resources.

USACERL's independent analysis also indicated that many, if not most, of the civilian employees and contractors working at DATP will probably not leave the area to seek new employment, further limiting likely impacts on the area. USACERL was unable to develop exact estimates of the number of General Dynamics contractors leaving the area because of the classified nature of the mission (which limited the availability of source data). However, anecdotal evidence suggests that this number is small. Conversations with Paul Thorne (the DATP Base Transition Coordinator [BTC]) and Prentice Parker (the DATP BRAC Environmental Coordinator) suggested that most of the General Dynamics contract employees had been reassigned to other jobs in the Detroit area, although no specific figures were available. Assuming that this is true, the net economic impact of this reassignment on the Detroit area would be negligible. The EDC application, conversely, assumes that all jobs held by former contractors will be permanently lost as these employees leave the area. Table 1.1 shows USACERL's findings in more absolute terms.

Table 1.1. USACERL estimates of adverse economic impact of DATP closure.

Type of Impact	Gross Output ($)	Employment (jobs)
Direct Impacts	37.4 million	251
Indirect & Induced Impacts	7.4 million	95
Total Impacts	44.8 million	346

Note that estimates for lost output and lost personal income do not map directly to the job loss estimates, because of the lack of detail in the available DATP budget data. These data limitations (again, caused by the classified nature of the mission) also prevented the calculation of a loss of personal income in the area. Also, since USACERL was able to obtain only gross figures that did not delineate specific budget expenditures, the above lost-output and lost-income figures only reflect possible mitigation measures that have been undertaken since the closure was announced. Thus, these estimates may overstate actual impacts. However, because USACERL was able to extrapolate some necessary information from average compensation and total employment figures, the magnitudes of these discrepancies should be fairly insignificant.

Finally, USACERL's independent economic model indicates that even the large three-county ROI selected in the DEA may be under-inclusive. USACERL's model indicated that total "leakage" effects were over $22 million of the total expenditures present in the year of closure. Such a large leakage effect would typically indicate to an analyst that the area chosen for study is under-inclusive.

Although USACERL elected to retain this study area to maintain compatibility with the DEA, it is likely that the choice of a larger analysis area would further minimize the significance of closure impacts, relative to the ROI.

Significance of Impacts

The results of USACERL's analysis generally fail to support the claim that closure impacts will dramatically affect the local economy. USACERL's findings also generally support the conclusions presented in the DEA, which suggests that total area impacts will not be significant.*

USACERL's analysis suggests that the total loss of employment caused by the closure will probably not be significant. As of 1995, total employment for the ROI amounted to over 1.9 million people, which means that even a total mothballing of DATP would result in a net loss of much less than 0.01% of the total area workforce. To be considered significant in light of historical area employment statistics, the total loss in workforce would have to be many times this size. The analysis presented in the Draft EA and USACERL's independent analysis both demonstrated similarly insignificant impact magnitudes for total economic output and personal income.

Analysis of the regional economy surrounding DATP also fails to support a claim of severe closure impacts. As the Draft EA notes, the unemployment rate in the area has actually fallen in the intervening years before and after the DATP closure was announced, from over 7.4% in 1990 for the ROI to a rate (as of 1995) of 4.6%. Analysis of other area economic indicators suggest that the greater Detroit region is recovering from an extended recession that occurred during the early 1990s in conjunction with area automaker layoffs, and will continue to experience at least short-term growth.

Caveats

Finally, it should be noted that USACERL's analysis and methodology is also subject to several limitations that may distort findings or limit their applicability. These limitations are as follows:

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* See DEA, pp 4-30 to 4-32, generally.

- This analysis is based on static modeling techniques which cannot capture dynamic economic effects that may manifest over a longer period, such as 5 to 10 years.
- This methodology does not capture underemployment effects and equates all jobs, so it does not fully reflect the possibility that former employees will be able to find new employment, but only at a lower compensation level.

It should also be noted that USACERL's analysis relied on the ROI used by the DEA, which included only three counties in the Detroit region, instead of a larger area that USACERL's economic models indicate might be appropriate.

Potential for Economic Recovery

As discussed above, USACERL's independent analysis indicates that the total closure impacts will be fairly insignificant, which also suggests a strong potential for a full recovery. Although job creation is discussed in more detail elsewhere (see Chapter 2, **Extent of Short- and Long-Term Job Creation**), a full recovery appears very likely even with extremely conservative job-creation estimates. Even if it is assumed that redevelopment will track USACERL's most constrained development schedule (see Chapter 4, **Business Plan Review and Market and Financial Feasibility Analysis**), it appears very likely that all of the jobs lost in the DATP closure will be recovered by at least year 4 of redevelopment. If redevelopment tracks USACERL's more aggressive schedule, all lost jobs could be recovered as early as year 2.

Conclusion

One of the primary goals for redeveloping DATP is to replace jobs being lost with its closing. Although the impact analysis presented in the EDC application suffers from a series of theoretical and practical limitations, USACERL has determined that, even under the most conservative assumptions, a full economic recovery from the closure of DATP will be likely, particularly given the relative insignificance of the closure on the local economy.

2 Extent of Short- and Long-Term Job Creation

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Background and Approach

The DATP EDC application is required by Federal law to discuss job creation prospects for the proposed reuse of the DATP facility. One of the principal eligibility criteria that the military must consider when reviewing an EDC application is the extent of short- and long-term job generation. Job creation, after all, is the primary intent of this "jobs centered" property disposal authority.

Although both the DEA prepared by the U.S. Corps of Engineers and the DATP Reuse Plan mention the prospect of job creation, neither document discusses potential job creation with any degree of particularity. Accordingly, USACERL elected to construct several model scenarios that were used to forecast potential post-redevelopment economic activity and job creation.

Since projections of gross revenue from tenant operations were unavailable at the time of this writing, USACERL established figures for short-term job creation, and general estimates of long-term job creation, by making some assumptions about the types and volume of economic activities that will likely take place after redevelopment. Implan Pro v1.1 was then used to model the effect of these assumptions and construct several "what-if" scenarios that could be compared with calculated closure impacts.

It is important to note that, although this forecasting procedure allowed USACERL to generate sound estimates, the following projections are only as

useful as the validity of the underlying assumptions. Major changes in these key assumptions, especially changes in the absorption schedules for existing and new gross square footage (see Chapter 4, **Business Plan Review and Market and Financial Feasibility Analysis**, for more detail on these schedules), or in the aggregate economic activities of the tenants, may lead to dramatic differences between the number of jobs actually created and these projections.

General Methodology

Following the standard procedure for applying an input-output analysis, USACERL first conceptually divided the economic impacts of the DATP redevelopment into short- and long-term impacts. For purposes of this analysis, "short-term" refers primarily to impacts related to the redevelopment process itself, such as the jobs and economic effects created as a result of construction and maintenance activities. "Long-term" refers to the impacts related to the ongoing activities of firms that will be permanent or semi-permanent DATP tenants.

Each group of impacts (short- or long-term) was then separately analyzed to determine both the types of economic activity that it might involve and the relative magnitude of each activity. By comparing these activities, and their volume, to similar activities already occurring in the local economy, USACERL was able to construct a series of multipliers describing the likely impact that any new (but similar) activities would have on the local area.

Since the elements of a regional economy are inherently interrelated, this general approach offers an effective way of measuring the entire impact of a given event. For example, each particular programmed capital improvement (or permanent industrial end user) will create a particular set of on-site jobs at DATP. Since these employees will purchase goods and services in the surrounding community, these on-site jobs will also create additional off-site jobs located in the economic area surrounding DATP. A local economic multiplier will capture both the impact of on-site job creation (a direct effect), as well as the number of additional jobs created as a result of on-site jobs and economic activity (an indirect effect). Once these effects are calculated for each activity, they can be grouped together to find total impacts.

Extent of Short-term Job Creation

To calculate short-term job creation using this methodology, USACERL first developed two scenarios estimating both the types of construction and maintenance activities that would be necessary to redevelop DATP, and the likely capital costs of these activities (see Chapter 5, **Need and Extent of Proposed Infrastructure Improvements**). Multipliers were then developed by examining the state of other similar construction and maintenance activities in the greater Detroit area. Finally, total direct and indirect impacts were projected by applying the multipliers for each scenario over a 3-yr capital improvement schedule.

According to USACERL's independent engineering analysis (see Chapter 5, **Need and Extent of Proposed Infrastructure Improvements**), likely total capital costs for the redevelopment will probably amount to between $16.1 million and $19.7 million, while the EDC application projects total costs of about $20.2 million. Since the EDC cost was higher than the range of USACERL's estimates, its capital improvements program was also modeled. After analyzing each programmed improvement, USACERL found that typical employment multipliers for redevelopment activities ranged around 2.2 for USACERL's engineering estimates to 2.05 for the engineering estimates in the EDC application. More simply, these multipliers indicate that, for each short-term construction job created, about 1.05 to 1.2 additional supporting jobs will be creating in the surrounding economy. These figures vary somewhat because of differences in the programmed capital improvements, although neither set of figures is unusual, given the types of economic activities that exist in the tri-county study area.

Applying these calculated multipliers directly to the cost estimates suggests that between about 210 and 245 direct and indirect short-term jobs will be created as a result of the DATP redevelopment process. Table 2.1 summarizes these results.

Table 2.1. Short-term job creation schedule.

	EDC Estimate	CERL Minimum	CERL Maximum
Short-Term Job Creation			
Direct Employment	109	95	110
Indirect & Induced Employment	115	114	132
Total Short-Term Job Creation	**224**	**209**	**242**

Note that all scenarios assume that all capital improvements will take place immediately, rather than over any sort of schedule. This assumption obviously simplifies what will actually occur; in fact, improvements will occur over a phased schedule as redevelopment proceeds. Despite this, USACERL elected to assume that all improvements will occur in 1997, because this assumption has the effect of forcing all short-term job creation to occur in the base year, which then allowed USACERL to avoid using speculative corrections that would be necessary for factors such as development schedule contingencies and inflation adjustments. Because of this acceleration assumption, USACERL's short-term job creation estimates should be viewed as close to the probable upper boundary of what will likely develop, rather than a specific forecast. Given the smaller magnitude and importance of short-term job creation in relation to long-term estimates, and the uncertainties of the capital improvements schedule, USACERL concluded that an idea of the maximum potential for short-term job creation would probably be most useful to decision-makers. Finally, note that USACERL made no attempt to calculate the duration of impact for short-term job creation. Typically, most of these jobs will last for at least several years, although the exact length of time is a function of a variety of factors such as the development time of the relevant capital expenditure, maintenance needs, and area economic trends.

Extent of Long-term Job Creation

As with the procedure for short-term job creation, long-term job creation estimates were generated by first considering the types of activities that are likely to take place during and after full redevelopment, developing appropriate multipliers to capture the local impact of these activities, and then projecting likely cumulative total impacts. However, the calculation of these estimates was constrained by the absence of information about the types of end users that are likely to lease space at the redeveloped DATP, and also about the volume of economic activity these end users are likely to generate. Although USACERL was able to generate gross estimates based on various assumptions about the total number of people that tenants at DATP might employ, and on assumptions about the type of tenants likely to locate at DATP, the inaccuracies inherent in this approach will likely result in a model that is less accurate than one based on actual gross revenue data.

Gross Output Analysis

Usable estimates of revenue volume were unavailable, so USACERL was forced to extrapolate potential revenue volumes by examining both the intensity and volume of potential DATP reuses. Both factors are important for a gross output estimate because employment projections are a function of both how fast the local market absorbs new space, as well as how intensively the new space is used.

Although the EDC application did not directly address the question of reuse intensity, some intensity figures were used in calculations presented in Appendix 7 of the EDC application. Where applicable, these figures were relied upon to recast the job generation estimates presented in the EDC application. All other calculations that required a reuse intensity estimate relied on the estimates generated by USACERL's standard engineering analysis. In general, these estimates varied from about 200 to 550 usable square feet of space per employee, depending on the specific use.

Estimates of probable reuse volume were also presented in the EDC application, although they varied somewhat from the estimates generated as part of USACERL's financial feasibility analysis. Accordingly, both scenarios were considered. Note, however, that both of USACERL's alternative scenarios (such as the environmentally constrained scenario) rely on the same volume projections as USACERL's preferred scenario (only the timing is different), so these were not considered separately here. Finally, note that the absorption projections presented in the EDC application, and those developed by USACERL, generally rely on the same market and absorption assumptions.

Multiplier Calculation

The lack of firm employer and revenue data meant USACERL needed to make some general assumptions about the types of end users likely to lease space at the redeveloped DATP. For example, since the entire facility is zoned "heavy industrial" and will likely attract end users engaged in heavy manufacturing, USACERL's analysis assumes that future tenants will be functionally similar to those of other heavy-industrial firms in the local tri-county area. Making this assumption allowed USACERL to aggregate similar industries in the area into a gross multiplier that generally describes the impact of a given form of redevelopment. Similar aggregation operations were performed for both projected office and research and development (R&D) uses.

After constructing these aggregations, USACERL found that typical employment multipliers for local industrial activities are probably about 2.07, depending on the use. Similarly, employment multipliers for office uses were found to be about 1.75. While such multipliers might typically be considered somewhat low for these types of uses, note that this particular model demonstrated a high degree of "leakage," which would partially account for lower figures. (See Chapter 1, **Adverse Economic Impact of the Closure on the Region and the Potential for Recovery After the EDC** for a more detailed explanation of this "leakage" factor.) These multipliers were used to develop the projections for both USACERL's employment scenario and to evaluate the LRA's projections.

Finally, because no accurate distribution of tenants was available for the "New Commercial" uses presented in the EDC application, USACERL created a weighted or "blended" multiplier. The application did not explain how these areas would be allocated, so it was assumed that these areas would be allocated equally to all possible uses. All other uses that were directly programmed used a specific (e.g., unblended) multiplier.

Long-term Employment Projections

After developing an idea of the economic volume that will take place after redevelopment, and the types of activities it will probably involve, USACERL developed several forecasts for likely long-term job creation. Table 2.2 summarizes the long-term employment projections calculated as part of USACERL's independent analysis and in the EDC application.

Several comments about this table are in order. First, EDC direct job creation estimates were taken only from Appendix 7 of the application. Although the direct job creation estimates presented in the EDC application were inadequate, the chief failing was that estimates presented in different parts of the application varied widely, without apparent explanation. The EDC application did not contain any language stating or implying that it was attempting to provide a range of estimates, yet it presented job creation estimates ranging from about 3,000 jobs* to over 5,000 jobs.† Because of these limitations (and the fact that the estimates presented in the table were marginally more coherent), USACERL

* See Appendix 7 in the EDC application.

† See pp 10-11 of the EDC application.

based all subsequent evaluation of the EDC directly on the job creation claims in Appendix 7 of the EDC application. Thus, although other figures are presented in the application, USACERL did not consider them in the calculations.

Finally, the EDC job creation scenario presented is actually a hybrid of EDC assumptions and USACERL-developed multipliers. In examining the EDC job creation scenario, it quickly became evident that it would not be possible to directly compare (or even fully evaluate) the claims made in the EDC application because it had not considered indirect job creation after redevelopment. Since the EDC application incorrectly ignores the possibility of any potential indirect or induced employment effect on the local economy, USACERL constructed indirect job creation estimates for the EDC figures with the same multipliers used for USACERL's independent analysis. Thus, all of the indirect job creation estimates in the table are based on USACERL-developed multipliers; only the direct job creation estimates were taken from the EDC application.

Table 2.2. Long-term job creation schedule.

Total (Direct & Indirect) Job Creation by Year	*1,998*	*1,999*	*2,000*	*2,001*	*2,002*	*2,003*	*2,004*	*Cumulative*
USACERL Projections								
Direct Job Creation								
Reuse Office (268 sq. ft. per person)	745							745.0
Reuse Industrial/Manufacturing (494 sq. ft per person)	1,836							1,836.0
New R&D/Industrial (550 sq. ft per person)		1,136	800	627				2,563.6
Total Direct Jobs								5,144.6
Indirect & Induced Job Creation								
Reuse Office (Multiplier of 1.75)	559							558.8
Reuse Industrial/Manufacturing (Multiplier of 2.07)	1,965							1,964.5
New R&D/Industrial (Multiplier of 1.76)		864	608	477				1,948.4
Total Indirect and Induced Jobs								4,471.6
Total Jobs Created	**5,104**	**2,000**	**1,408**	**1,104**				**9,616.3**
DATP Projections								
Direct Job Creation								
New R&D/Industrial (550 sq. ft per person)		355	444	554	421	444	444	2,661.1
New Commercial (400 sq. ft. per person)			327	218	109			653.4
Total Direct Jobs								3,314.5
CERL Indirect & Induced Extrapolation								
New R&D/Industrial (Multiplier of 1.76)		270	337	421	320	337	337	2,022.5
New Commercial (Multiplier of 1.91)			297	198	99			594.6
Total Indirect and Induced Jobs								2,617.0
Total Jobs Created		**624**	**1,405**	**1,392**	**950**	**781**	**781**	**5,931.8**

Note: For purposes of the above calculations, "New Commercial" land uses represent a blended aggregate of both office and industrial space; since specific breakdowns of the amount of space that will be devoted to each use are not available, it is assumed that both types of land uses will occupy about the same amount of space

Caveats

Because USACERL necessarily made a variety of assumptions in order to construct these estimates, several caveats are in order. Although USACERL has attempted to present conservative estimates that minimize the possibility of overstating job creation estimates where possible, there are always potential problems that can arise when economic forecasts are based on such a large assumption set.

First, as noted, assumptions were made about both the volume and the types of economic activities that will take place at DATP, which are both crucial to the projections. While USACERL has determined that these assumptions are reasonable, given the state of the local market and adopted reuse plan, reductions in either the absorption rate or the intensity of reuse would further reduce job creation. For example, although the absorption schedule is a reasonably conservative estimate, a reduction would directly impact potential gross output, and thus future job creation. Similarly, the employment per square foot estimates were derived from broad industry-average standards. Less intense reuse, such as that associated with warehousing facilities, would also likely result in the creation of fewer jobs. Note that changes in these assumptions would be particularly significant, since they would affect both the direct and indirect forecast figures.

Second, the modeling procedure used to construct these estimates (a standard input-output model) assumes that an underlying regional economy is static in nature and cannot capture essential long-term structural changes. Thus, fundamental shifts in a local economy may render its projections inaccurate, especially with regard to indirect and induced projections.

Third, this analysis does not consider other privately funded economic activity that will accompany the DATP redevelopment. For example, none of the short-term economic effects related to the refitting of Building 4 by eventual tenants were considered, although this construction will undoubtedly have some effect on area employment. USACERL elected not to model these effects, both because they will likely be transitory in nature, and because it would have been difficult to obtain necessary cost or revenue data from private developers. This omission will likely cause total job creation effects to be understated, although the degree of error should be small.

Finally, no attempt was made to adjust for inflationary effects, because the lack of data about future gross output precluded USACERL from developing an acceptable method of adjusting long-term estimates. Errors caused by this omission will likely be insignificant.

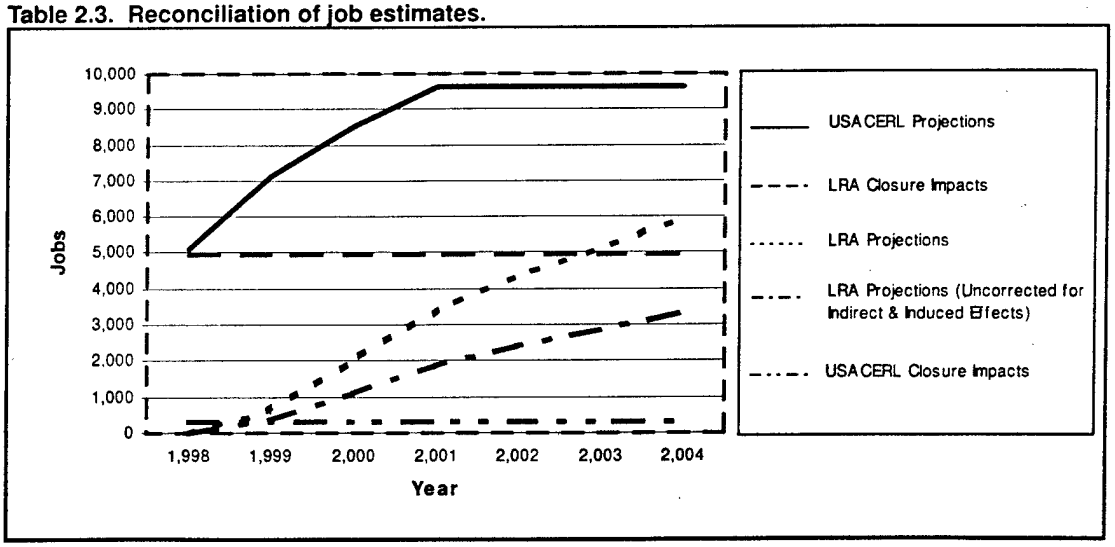
Reconciliation of Job Creation Projections and Closure Impacts

As the final step of the analysis, USACERL compared the various employment generation forecasts to the economic impacts of the DATP closure (see Chapter 1, **Adverse Economic Impact of the Closure on the Region and the**

Potential for Recovery After the EDC). This final analytical step is intended to offer an idea of when total closure impacts might reasonably be mitigated, and to offer a general qualitative picture of how programmed capital expenditures affect job creation. Table 2.3 shows the results of this step.

As the graph denotes, USACERL's projections suggest that most of the employment impacts of the closure will have been fully mitigated almost immediately after redevelopment begins; even the (USACERL-corrected) projections developed in the EDC application suggest full mitigation will occur in the second year of redevelopment. Note that the uncorrected predictions advanced in the EDC application forecasted only direct job creation, and did not consider indirect and induced effects; this is graphed here as "Uncorrected for Indirect & Induced Effects." Although, it is USACERL's position that ignoring these effects is an incorrect methodological practice, these EDC "estimates" are reproduced here to offer the reader an idea of what is claimed in the EDC application. Note that, under a direct-only schedule, closure impacts are not fully mitigated during the redevelopment timeline.

Table 2.3. Reconciliation of job estimates.



Conclusion

As noted earlier, the extent of both short- and long-term job creation is directly linked to the absorption schedule for buildings and land within the EDC parcel, and the reuse intensity of these improvements. Depending on the absorption schedule and reuse intensity, USACERL has found that it is reasonably possible that a total of about 9,616 jobs could be created as a result of the DATP redevelopment.

3 EDC Application's Consistency with the Overall Redevelopment Plan

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Background

The DATP Comprehensive Reuse Plan was approved by the Warren City Council on 30 April 1997 and revised on 2 May 1997. The City of Warren has been authorized to act as the implementing LRA pursuant to the State of Michigan Home Rule Cities Act codified at MCLA 117.1 et seq. Based on the application material submitted by the LRA, it has been determined that the DATP Comprehensive Reuse Plan is generally consistent with the EDC application. Section I.E. of the EDC application addresses conveyance consistency with the Reuse Plan, and USACERL finds it to be generally accurate.

A unique aspect of the DATP EDC is the RFP process initiated by the City of Warren to solicit interest in the redevelopment of the site. RFP advertisements were placed in the *Wall Street Journal* and resulted in the submission of 11 redevelopment proposals for all, or part of, the EDC parcel. Several proposals, based on the 1997 adopted Reuse Plan, were reviewed by USACERL for overall reuse consistency.

Objective

The objective of this section of the review was to determine whether the implementation strategy proposed in the EDC application/business plan is consistent with the Comprehensive Reuse Plan and redevelopment proposals. The criteria set forth for evaluating consistency are: (1) does the application

capture the spirit and intent of the Reuse Plan, and (2) is the application consistent with the Reuse Plan's marketing and strategy and implementation plan?

General Finding

After reviewing the City of Warren EDC application and Comprehensive Reuse Plan, USACERL finds that the application is generally consistent with the goals, objectives, and implementation strategies set forth in the DATP Comprehensive Reuse Plan. However, USACERL did not observe any apparent alternative implementation strategies in the application as were set forth in the Reuse Plan. Upon review of the development proposals solicited under the RFP, it became clear that these alternative implementation strategies might better serve likely redevelopment scenarios.

The application captures the spirit and intent of the reuse plan by meeting the following goals and objectives:

1. The proposed reuse of DATP provides for the optimal reuse of the facility and/or site under anticipated, realistic market conditions that offer the greatest potential for the City and the regional economy.

2. The proposed reuse provides an orderly and timely transition from plant closure to reuse implementation, which will minimize any negative effects of the plant closure on the City of Warren and the region.

3. The proposed reuse ensures that the character, quality, and scale of new development are compatible with and meet or exceed the needs of the City of Warren.

4. The proposed reuse optimizes the marketability and value of the site and facilities, creates jobs for the region, and provides direct and indirect economic benefits to the City of Warren.

5. The proposed reuse provides development cost parameters which are outweighed by the economic benefit return for the proposed reuse.

The application is consistent with the Reuse Plan's marketing strategy and implementation strategy as follows:

1. The application supports redevelopment as a technology park for R&D and developmental manufacturing, taking advantage of the region's comparative advantage in R&D and industrial activities.

2. The application advances a realistic phasing plan that should facilitate orderly development through flexibility to changing market conditions, needed infrastructure improvements, and demolition of obsolete buildings. However, USACERL did not observe any substantive effort related to environmental remediation and associated clean-up schedules. Although the proposed phasing plan appears reasonable from a real estate market and capital investment standpoint, it does not appropriately consider the likely impacts of potential clean-up schedules which could, at a minimum, delay property sales.

3. The application identifies and programs both on- and off-site capital improvements that will facilitate redevelopment through improved transportation, access, and services. However, USACERL noted deficiencies in the applicant's capital improvement program relative to inconsistent capital costs, a lack of improvement descriptions, and improvement locations. This constraint was further magnified by the fact that private sector investment in site utilities and infrastructure is unknown. It might be entirely possible that the City of Warren may alter its proposed capital improvement plan in light of the strong RFP response. However, monitoring such modifications in capital investment after the technical review is completed falls outside the scope of USACERL tasking.

4. The application identifies an array of target industries that fall into three categories: (1) Building 4 target industries, (2) research and development, and (3) commercial. By marketing to targeted groups of users, the success of implementation and, ultimately, job creation increases dramatically. Marketing efforts are further enhanced by the fact that 11 development proposals were submitted and that the EDC parcel is a State of Michigan Renaissance Zone.*

* See Chapters 6 and 7 for a detailed discussion of Renaissance Zone benefits.

Development Proposals

In an attempt to evaluate the consistency of the development proposals submitted to the City of Warren under the RFP, USACERL independently reviewed seven proposals within the framework reuse plan goals. The proposals shared by the City of Warren for review are as follows:

- Kojaian/DCT/Signature
- Ashley Capital
- HSA READ
- DeMattia Company
- Venture
- Crudo Brothers
- CenTra, Inc.

In an effort to expedite the technical review and attempt to be more reflective of the LRA's redevelopment goals, USACERL requested that Warren identify the three proposals which presented the most potential. Those proposals were Kojaian/DCT/Signature, Ashley Capital, and HSA READ.

Review of the proposals revealed that they were generally consistent with the DATP Comprehensive Reuse Plan, and in some instances exceeded articulated goals and objectives. All three proposals indicated a mixed use of R&D, industrial, office, and limited commercial space for total job creation matching or exceeding reuse plan projections. However, other than the programmed reuse of Building 4, it was unclear to USACERL what level of capital improvements would be the responsibility of the company(ies) ultimately awarded a development contract.

4 Business Plan Review and Market and Financial Feasibility Analysis

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Introduction

The objective of this chapter is to provide a review and analysis of the financial feasibility of the EDC application and related business plan. USACERL's technical review of financial feasibility includes market analysis and the need and extent of proposed infrastructure investment (discussed in more depth in Chapter 5, **Need and Extent of Proposed Infrastructure Improvements**). This review of the EDC business plan includes:

- a 7-yr property development timetable, phasing plan, and cash flow analysis
- a market and financial feasibility analysis describing the economic viability of the project, including:
  - an estimate of net proceeds over the project development period
  - the proposed consideration and payment schedule to DoD
  - the estimated fair market value

- a cost estimate and justification for infrastructure and other investments needed for the development of the EDC parcel (Chapter 5, **Need and Extent of Proposed Infrastructure Improvements**).

- local investment and proposed financing strategies for the development (also covered in Chapter 6, **Extent of State and Local Investment and Risk**).

Background

The City of Warren, acting as the approved LRA, is requesting a no-cost EDC for approximately 153 acres of land and improvements along with all utility systems located at DATP.* The EDC parcel contains approximately 53 buildings and 1.45 million square feet of existing building space.

Property Description

The DATP is a government-owned, contractor-operated facility on the eastern side of the 342-acre Detroit Arsenal. DATP consists of approximately 153 acres on the west side of Van Dyke Avenue, about one-quarter mile north of Interstate I-696 in Warren, MI (see Figure 2). DATP consists of 53 buildings with approximately 1,453,000 sq ft of building area. The northern portion of DATP formerly supported the tank production plant in Building 4, a 1,125,389 sq ft manufacturing facility originally built during World War II. A parking lot at the northeast corner of DATP accommodates approximately 4,000 autos. Three office buildings (Buildings 1, 2, and 3), with approximately 68,000 sq ft of total building area, front Van Dyke Avenue. The central heating plant (Building 5) is in the northwest corner of the EDC parcel.

The southern portion of the EDC parcel contains a 1-mile test track. The test track occupies approximately one-half of the entire EDC parcel. Seven unused wooden barracks (Buildings 12, 14, 15, 18, 19, 21, and 22) are located along the southern Van Dyke Avenue frontage (USCOE Mobile District 1997).

* It is important to note that the City of Warren is requesting the entire 153-acre DATP site. However, the Army intends to retain Buildings 7 and 8 as part of the remaining TACOM mission. The exclusion of these buildings results in a total EDC request of 147.7 acres. The Army may convey the buildings at some point in the future when mission requirements are fulfilled elsewhere or have ceased altogether.

The EDC parcel is situated entirely within the City of Warren and is currently zoned M-3, heavy industrial. DATP was established in 1941, and during World War II produced approximately 22,000 tanks. The DATP continued to manufacture armored vehicles until 1995 (City of Warren 1997).

The Army and the State Historic Preservation Officer (SHPO) have agreed that the EDC parcel has historic value, principally because Buildings 1, 2, 3, and 4 were designed by the architectural firm of Albert Kahn and served a prominent mission for one of the most well-known events in history. The DATP site and various buildings have been the subject of discussion between the Army and the Michigan SHPO. It is anticipated that chronicling the history of certain buildings will meet state and Federal preservation requirements. A memorandum of agreement will be developed to ensure compliance with prescribed preservation requirements.

Approach

Overview

The approach to the technical review included a review of the entire EDC application package and supporting documents and reports, including several proposals for reuse solicited by the City. USACERL's business plan contractor, Bay Area Economics (BAE), also conducted interviews with Ed Servitto and Paul Thorne, the City of Warren Assistant Attorney and DATP Base Transition Coordinator, respectively. BAE conducted visits to the EDC site and the surrounding community on 20-21 August 1997 and 7-9 September 1997. To aid in the analysis and documentation of financial feasibility, BAE developed a spreadsheet model to provide cash flow projections, sensitivity analysis, and valuation calculations. The output of analyses from this model (including pro formas, absorption schedules, and improvement tables presented at the end of this chapter) are intended to provide the detailed documentation of the analysis findings. In general, the model was used to (1) recast the LRA business plan assumptions and discounted cash flow results and (2) develop several alternative scenarios.

The City of Warren EDC Business Plan

The primary objective of the City of Warren's EDC application is stated as "the rapid redevelopment of the DATP site and ultimate generation of maximum employment at the site" (City of Warren 1997). The EDC proposes the creation

of an industrial condominium park referred to as the "Arsenal Industrial Park" under the Michigan Condominium Act (MCLA 559.101). The EDC states that the creation of an industrial condominium park would permit an almost immediate transfer of the property and would provide the City with substantial continuing control of the development to achieve its primary objective of creating well-paying jobs (City of Warren 1997).

The business plan proposes the first phase of development in the northeast section of the EDC parcel along Van Dyke Avenue. According to the EDC application, "This location would permit the redevelopment to proceed immediately without the necessity of demolition or substantial infrastructure investment. All major utility and road access would be readily accessible to this portion of the site and environmental concerns are *de minimus* facilitating this development" (City of Warren 1997).

Financial assistance in the development of the second phase and related demolition of the first phase would be available through the City of Warren's Downtown Development Authority (DDA). The DDA captures tax increments above the 1993 valuation from certain taxes including property taxes. The DDA is permitted to use these and other funds obtained through bond issues for the development of infrastructure in the DDA Zone (City of Warren 1997).

Phasing plan and development timetable. Phase I of the business plan's development timetable is composed of approximately 16 acres situated in the northeast corner of the EDC parcel. Historically, this area has been used for parking with a minimum exposure to hazardous materials.

Phase II consists of commercial and industrial development of approximately 55 acres in the southeast corner of the EDC parcel. This phase of development also considers the acquisition of additional land for access to the I-696 service drive. This access is required primarily for the Phase III development, because the Phase II development is directly contiguous to Van Dyke Avenue.

Phase III development is 35 acres in the southwest corner of the EDC parcel. The site will require demolition of approximately half of the tank test track. Little other site preparation costs are anticipated, though this portion of the site has environmental concerns as a result of long-term waste disposal that has occurred in this area.

Phase IV development covers 72 acres, representing the balance of the site. This area has the greatest amount of facility demolition needed for site preparation.

Phase V development, as called for in the DATP Reuse Plan, is a flexible redevelopment of the commercial uses called for in Phase II. The DATP Reuse Plan recognizes a commercial use as viable on a relatively short-term basis (20 years) and ultimately contemplates redevelopment of this 30 acres for R&D use.

Job creation. The EDC application estimates that approximately 15 to 35 jobs per acre would be generated on the project site with the proposed R&D and industrial development mix. The completion of the development under the EDC business plan could create up to 5,355 jobs, primarily in the $21 to $35 an hour wage range. The EDC business plan contemplates a secondary effect to the local economy that would:

- enhance the existing commercial/retail sector
- create new opportunities for the light industrial sector
- enhance the existing tool and die sector
- stimulate demand for higher quality housing (City of Warren 1997).

Recast of LRA Business Plan

To evaluate market and financial feasibility of the EDC business plan, BAE has recast the LRA's assumptions into a spreadsheet model to regenerate the pro formas in the LRA business plan. This regeneration also provides the opportunity for BAE and USACERL analysts to fully understand the assumptions that support the LRA's revenue and cost projections. In the course of reviewing the LRA business plan, BAE examined the assumptions relating to phasing, costs, and revenues for the proposed development. Specific issues related to this analysis are discussed in the next section.

After submitting the EDC application to the Department of the Army, the City of Warren received development proposals from 11 groups responding to a City-initiated RFP solicitation in the *Wall Street Journal*. The 11 concerns responded to the City's request for reuse and price proposals that would conform with the Reuse Plan, proposed zoning, and Renaissance Zone criteria. The most promising of these proposals, as suggested by Assistant City Attorney Servitto, were reviewed by BAE to help judge the market response to the LRA's EDC business plan and to shape the recasting of the business plan and development of alternative scenarios.

Although the three proposals reviewed by USACERL and BAE* provided adequate detail in terms of job creation, land-use ratios, and general site improvements, they fell short in describing the potential relationship of the City relative to the redevelopment of the site. This question is critically important in light of the City's election to acquire the site from the Department of the Army through an EDC. One of the key questions that the Secretary of the Army must answer before approving an EDC is whether other conveyance methods could be used to accomplish job creation goals. If the companies that bid on the site require little or no investment from the City to successfully redevelop the site and create jobs, other transfer authorities could be used to directly sell the property to the private sector interest. However, based on the information made available to BAE and USACERL analysts at the time of this review, the LRA's proposed level of investment into job creation appears to be adequate.

For the purposes of the business plan analysis, it was assumed by USACERL and BAE that the level of investment proposed under Strategy 1 of the business plan and Strategy 2 of the DATP Comprehensive Reuse would remain unaltered as a result of the robust RFP response. This assumption naturally carries risk but, in the absence of any additional information at the time of the review, was deemed appropriate. The question of LRA job creation investment must be appropriately addressed during negotiations with the Army to determine the appropriateness of an EDC.

Development phasing, costs, and revenue. The LRA business plan assumptions regarding final land use and phasing were deemed appropriate. In the business plan recast, BAE preserved the LRA land use strategy that the EDC site would be developed as industrial lots to be sold as land to developers or corporations to build R&D/light industrial facilities, consistent with EDC review guidance specified in the DoD Base Reuse Implementation Manual. As in the LRA plan, the 30-acre southeast corner would be sold for development as a commercial site focusing on recreation and entertainment uses. The phasing in the LRA plan was deemed to be appropriate and the 1998 to 2004 absorption schedule was used unchanged. Additionally, the $3.00 per sq ft of land sale revenue was deemed to be within an appropriate range. The **Market Feasibility Analysis** section of this chapter discusses market phasing and

* The three proposals suggested by Mr. Servitto as best fulfilling the City of Warren's reuse goals were from Kojaian/DCT/Signature, Ashley Capital, and HSA READ.

revenue in more detail. The recast business plan development absorption is shown in Table 4.1.*

Capital costs. Capital costs required to implement the LRA's EDC business plan were examined by USACERL staff and engineers. USACERL engineers independently evaluated the improvement programs and associated costs for demolition, utility replacement, major access improvements, and right-of-way acquisition. The analysis of required capital improvement programming and related costs is discussed in more depth in Chapter 5, **Need and Extent of Proposed Infrastructure Improvements.** USACERL developed a "minimum" and "maximum" cost for each improvement, but ultimately relied upon developed "maximum" costs based on USACERL's and BAE's assessment of adequate levels of investment to support job creation goals. Tables 4.2 and 4.3 show the magnitude and timing of capital costs associated with the LRA business plan.

Operational costs. BAE examined the operational costs included as part of the LRA's EDC business plan. The cost associated with land sales, estimated by the LRA to be 5% of sale revenue, was deemed to be appropriate. Though this cost is usually lower (often 2 to 3% of the total transaction), the need for brokerage fees as well as the complexity of title transfer due to environmental and escrow constraints justifies this cost. The LRA estimated the cost of operations and maintenance of unsold land to be $3,000 per acre. This cost was considered too high. BAE applied a cost factor of $600 per acre for alternative scenario analysis, which was deemed to be appropriate to cover costs of trash removal, weed control, storm drain clearing, insurance, and other minor operation and maintenance (O&M) associated with vacant industrial land.

Findings – Recast LRA EDC Business Plan. Table 4.3 shows the development cash flow using the City of Warren's capital and operating costs with 12 and 15% discount rates to arrive at a net present value (NPV) for the proposed business plan. From the results of this analysis, the NPV of the recast LRA business plan is in a range from *negative $7.1 million* to *negative $6.5 million* compared with the LRA's indicated NPV of *negative $10.2 million* found in Attachment 7 of the EDC application.

* Tables are shown beginning on p 59.

LRA Scenario With USACERL/BAE Costs

As mentioned previously, USACERL and BAE independently developed capital costs for the redevelopment of DATP. The result of this analysis is "USACERL/ BAE Maximum Capital Costs," which is presented in Table 4.4. The applicant estimates a capital improvement program of $20.2 million (Table 4.2) which offsets projected revenues of $18.8 million (Table 4.3). However, further analysis revealed that building demolition costs were likely overstated by the LRA based on findings from the Corps of Engineers Appraisal and interviews with Detroit-area demolition contractors. Applying the demolition cost estimates, the 5-yr capital improvement program is reduced from *$20.2 million* to *$16.2 million* (Table 4.4). When project NPV for the LRA Scenario is recalculated, project NPV increases to a range of *negative $2.4 million* to *negative $1.7 million* at 15 and 12% discount rates (Table 4.5). When $6 million in local investment is applied to partially offset large capital expenditures in 1998 and 1999, project NPV further increases to a range of *positive $2.9 million* to *positive $3.8 million* at 15 and 12% discount rates.

USACERL/BAE Created Scenarios

CERL1 Scenario

This scenario was developed based on the premise that Building 4 is retained and sold as part of a 65-acre parcel to a developer or user in an "as is" condition. The balance of the EDC parcel will be sold as industrial lots. Table 4.6 shows the development absorption schedule for CERL1. This schedule, showing market absorption of the industrial lots between 1998 and 2001, reflects the proposed project schedules in the request for quote (RFQ) responses reviewed by BAE. Revenue from industrial land sales was estimated at $2.50 per sq ft of land based on review of available market comparable data. The data indicated a market rate between $2.00 and $3.00 per sq ft of land. Given the site characteristics of the EDC parcel (freeway access, large parcel size) a price in the mid- to high-end of this range was deemed appropriate. Revenue from the "as is" sale of Building 4 has been estimated at $10.1 million based on review of market comparable data obtained from the Oetzel-Williams appraisal report (1997) and BAE review of available subregional market comparables.

USACERL developed site preparation and utility costs as well as costs associated with fitting up Building 4 to an acceptable "as is" condition. This fit-up includes a working roof system, HVAC system, and concrete slab floor. All

interior and end-user fit-up costs are assumed to be borne by the developer or end user. Capital costs for site preparation, infrastructure, and Building 4 fit-up are discussed in more depth in Chapter 5, **Need and Extent of Proposed Infrastructure Improvements**. Tables 4.7 and 4.8 show site preparation/ utility and Building 4 fit-up costs, respectively.

Findings – CERL1 Scenario

Table 4.9 show the development cash flow using the USACERL/BAE maximum cost scenario (Table 4.7) at 12 and 15% discount rates to arrive at an NPV for the proposed business plan. From the results of this analysis, the NPV of the CERL1 scenario is in a range from *negative $1.9 million* to *negative $1.8 million* without the application of local investment to offset capital expenditures in 1998 and 1999. When capital improvement offsets of $6 million are applied, project NPV increases to a new range of *positive $3.4 million* to *positive $3.7 million* at 15 and 12% discount rates, respectively.

CERL2 Scenario

This scenario is a variant on CERL1 but differs from CERL1 in two major respects so as to develop a "best case" reuse scenario for Building 4. Revenue from industrial land sales was estimated at $3.00 per sq ft of land, reflecting recent increases in industrial land values in the subregion. Additionally, the site characteristics of the EDC parcel could potentially command sale prices at the top end of the observed market range to the proper end user. The development absorption schedule for CERL2 is identical to CERL1 as shown in Table 4.6. CERL2 also includes potential grant revenue in the evaluation of the development project cash flow. The City is pursuing a Renaissance Fund grant of $5 million to assist with site preparation. BAE estimates that the LRA could secure a Federal Economic Development Agency (EDA) grant of $1 million for infrastructure improvements. The development cash flows discussed later in this chapter reflect these grants in the evaluation of the financial feasibility of the CERL2 scenario. Project capital costs are identical to CERL1, as shown in Tables 4.7 and 4.8.

Findings – CERL2 Scenario

Table 4.10 shows the development cashflow using the USACERL/BAE maximum cost scenario and 15 and 12% discount rates to arrive at an NPV for the proposed business plan. From the results of this analysis, the NPV of the CERL2 Scenario is in a range from *negative $585,000* to *negative $337,700* in the

absence of capital cost offsets. When $6 million in capital offsets are applied to 1998 and 1999 capital expenditures, project NPV increases to an indicated range of *positive $4.7 million* to *positive $5.2 million.*

CERL3 Scenario

The CERL3 scenario reflects a development process slowed by environmental encumbrances. Building 4 is reused in 1998 as in the CERL1 and CERL2 scenarios, but the sale of industrial lots is delayed due to potential environmental clean-up and title transfer delays. Industrial lots are absorbed from 2001 to 2009, reflecting an initial delay of title transfer and slower project absorption due to perceived or real environmental encumbrances that make the property less attractive to prospective tenants. Table 4.11 shows the development absorption schedule for CERL3. Project capital costs are identical to CERL1 and CERL2, as shown in Tables 4.7 and 4.8.

Findings – CERL3 Scenario

Table 4.12 shows the development cash flow using the maximum cost scenario and 15 and 12% discount rates to arrive at an NPV for the proposed business plan. From the results of this analysis, the NPV of the CERL3 scenario is in a range from *negative $3.9 million* to *negative $3.2 million.* Capital cost offsets from local investment increase project NPV to a new range of *positive $1.3 million* to *positive $2.2 million* at 15 and 12% discount rates, respectively.

Business Plan Review and Findings

Introduction

According to the LRA, the proposed EDC is entirely consistent with the adopted DATP Reuse Plan. As stated in the City of Warren's EDC application, the LRA goal is "the rapid redevelopment of the DATP site and ultimate generation of maximum employment at the site" (City of Warren 1997).

The City of Warren is the only public agency responsible for acquisition, control, maintenance, and redevelopment of DATP. The following section reviews and analyzes the LRA business plan.

The business plan provided in the EDC application is significantly lacking in the details necessary to perform an effective review and analysis. Nevertheless,

BAE has analyzed the EDC business plan in the context of supporting documentation and analysis performed by the LRA as part of the Reuse Plan and by the Corps of Engineers as part of base closure activities. These documents have enabled BAE to effectively recast the business plan in order to perform an effective and thorough review and analysis.

Phasing plan and development timetable. As described above, the LRA's EDC business plan would develop the EDC parcel in multiple phases from 1998 to 2004. The CERL alternative scenarios explore different timetables for development. CERL1 and CERL2 scenarios represent a more rapid development timeframe from 1998 to 2001. CERL3 uses a development timetable constrained by environmental cleanup and related delays and contemplates a development phase of 1998 to 2009. The phasing plan proposed in the EDC business plan is deemed to be feasible. More detail regarding the feasibility of the phasing is found in **Market Feasibility Analysis** later in this chapter.

Estimated fair market value of the EDC parcel. The LRA business plan concludes that the fair market value for the proposed redevelopment of DATP is a *negative $10.2 million*. This figure is derived from the NPV of the cash flow modeled in the BRW/Giffels Reuse Plan Report, included as Attachment 7 of the EDC application. Using the BAE recast of the business plan and alternative scenarios developed for this analysis, fair market value is estimated in the range of *negative $1.7 million* to *positive $3.8 million* for the recast business plan and a range from *negative $3.9 million* to *positive $5.1 million* for the alternative scenarios. However, a portion of the value of the discounted cash flow was derived from significant grant funding being pursued by the LRA to defray the cost of major infrastructure costs. It is difficult to directly attribute these sources of funding to the real estate fair market value of the redevelopment alternative described herein. A more accurate assessment of value of the cash flow would be divided into sources of that value:

- Real estate: NPV ranging from *negative $3.9 million* to *negative $337,755*
- Grant funding: Present value of *positive $5.1 million.*

Consideration to the Army. The LRA's EDC application proposes that the Army receive no direct monetary payment from the City of Warren. In the EDC application, the City cites the negative project value derived and the cost saving to the Army as reasons for this conclusion. The LRA indicates that the risks associated with its estimated level of investment and potential return do not warrant monetary payment to the Army. BAE's analysis indicates that the EDC parcel could potentially have a positive fair market value, as noted above, in the

range of *negative $3.9 million* to *positive $5.1 million*. However, as noted, positive NPVs were only calculated when $6 million in grant funding was applied to capital expenditures programmed in 1998 and 1999.

Local investment and proposed financing strategies for development. The EDC business plan proposes several local sources of investment to assist in the financing of improvements needed to implement the reuse plan. A major source of local and state funding is the site's Renaissance Zone designation. This designation allows for the waiving of taxes for state personal income, single business, and state education; local real property and personal property taxes on operating millages; and local income and utility user taxes. This waiver represents a major strategy for development implementation by being a major attractor of prospective tenants. It also represents a major investment in the project in the form of foregone general fund revenue at the state and local level. The NPV of the foregone real property tax is estimated to range from $1.5 to $2.5 million dollars. Other investment has been proposed in the form of DDA tax increment financing from the City of Warren, Renaissance Fund grants up to $5 million from the State of Michigan, and EDA grants up to $1 million for infrastructure.

Market Feasibility Analysis

To understand the financial feasibility of site development at DATP, it is necessary to assess the real estate market and identify state, regional, and local trends that may suggest opportunities or pose constraints. The LRA business plan must be analyzed to determine whether sufficient demand exists to absorb the land and facilities within the projected timeframe and at the pro forma market rates. The LRA's findings indicate that the available building space and developable land can be absorbed by the market at a fairly rapid rate. Additional analysis, conducted by BAE, suggests that absorption may in fact be accelerated from the levels discussed in the LRA's market analysis.

Determining the market potential for the DATP site is a complex task. The LRA completed a market study using the resources of Plante & Moran, LLC. The LRA's analysis concentrated on the entire Southeast Michigan real estate market. Its study tracked real estate trends for the following development types: (1) office (Class A, B, and C); and (2) industrial (bulk distribution, manufacturing, and R&D/high technology) sectors. When the LRA completed its analysis, real estate data for office developments were only available for the

Metropolitan Detroit area. Industrial absorption data were presented for both Metropolitan Detroit and for Warren.

BAE found the LRA's market research methodology to be reasonable. However, its absorption rate conclusions may be somewhat conservative. BAE's market research indicated a strong demand for industrial space in the Detroit metropolitan region. So strong was this market demand that the absorption schedule outlined in the LRA's analysis is feasible and could probably be accelerated. This finding is supported by the responses to an RFQ solicitation issued by the LRA. Eleven proposals were submitted, indicating strong interest in the property. The LRA identified three proposals that it felt most reflected the goals of the City of Warren and the LRA for the DATP site. These three proposals, which were reviewed by BAE, all had projected complete project absorption in the 1999-2001 timeframe. In this light, the 1998-2004 development absorption schedule, proposed in the EDC business plan, is credible and somewhat conservative.

The pricing strategy for the DATP properties appears reasonable based on market conditions and data. The rent levels projected by the LRA market study are on the high end of current rates.

Financial Feasibility Analysis

Traditional commercial real estate development financial feasibility analysis requires developing cash flow scenarios that reflect the costs, risks, and revenues associated with the development strategy being evaluated. Ultimately, financial feasibility of a given scenario is calculated by deriving the NPV of the forecasted future cash flows. The discount rate is determined by an assessment of the level of risk and can be equated to the required rate of return the investor seeks with similar investments. The NPVs of the scenarios analyzed for this review have been calculated using a range of discount rates from 12 to 15%. This range is a reasonable reflection of discount rates for moderate- to moderately-high-risk real estate projects. Using these discount rates, the NPVs of the alternative scenarios range from *negative $3.9 million* to *positive $5.1 million*. Additionally, a significant level of investment from state and local entities exists in the form of Renaissance Zone tax relief, DDA tax increment financing, and other assistance, as well as potential funding from EDA and the state Renaissance Fund in the EDC business plan. All scenarios that include grant funding show a positive NPV. BAE concludes that the EDC business plan

is financially feasible with the participation of local government partnership and with grants and other funding and assistance from state and Federal agencies.

Scenario and Sensitivity Analysis

Table 4.13 summarizes the recast EDC business plan and CERL1 through CERL3 scenarios. Additionally, a sensitivity analysis was performed to determine the effect of including grant funding in the development cash flow for final scenario NPV ranges. As discussed above, each development scenario was forecast with a minimum and maximum range of capital improvement costs and the NPV calculated using both a 12 and 15% discount rate.

Summary of Table 4.13 – sensitivity and scenario analysis.

	Maximum Costs		With Cost Offsets	
Scenario	15%	12%	15%	12%
Recast EDC Business Plan	($2.4)	($1.7)	$2.9	$3.8
CERL1	($1.9)	($1.8)	$3.4	$3.7
CERL2	($0.58)	($0.34)	$4.7	$5.1
CERL3	($3.9)	($3.2)	$1.3	$2.2
(All amounts represent NPV in millions of $.)				

Conclusions

USACERL/BAE finds that the LRA business plan has a high probability of achieving market and financial feasibility, both as proposed in the application and as developed in the alternative scenarios. The NPV of the recast LRA business plan for the project analysis period until the EDC parcel is completely sold as industrial lots was found to be in a range of *negative $2.4 million* to *positive $3.8 million.* USACERL/BAE's alternative scenarios for the business plan produce an NPV range from *negative $3.9 million* to *positive $5.1 million* with the inclusion of grant funding on the high end.

Because of the high degree of project uncertainty related to the outcome of the development proposals, the LRA's level of public investment into job creation, and environmental cleanup schedules, USACERL and BAE find that it is inappropriate to recommend a final range of estimated project NPV. Rather, the alternatives and scenarios developed by USACERL and BAE should be used as decision support for negotiations when more information on these matters will likely be available. Moreover, because of a lack of an adverse economic impact

from the closure as demonstrated in Chapter 1, **Adverse Economic Impact of the Closure on the Region and the Potential for Recovery After the EDC**, it is difficult for USACERL to recommend a discounted conveyance based upon that EDC criterion. Therefore, in the absence of information concerning the issues discussed above and the lack of an adverse impact from the BRAC decision, USACERL makes a preliminary recommendation that the EDC parcel be conveyed with no cost discount pursuant to the fair market value specified in the Corps of Engineers' appraisal.

Table 4.1. DATP Projected Absorption and Revenues

Development Absorption and Revenues

LRA EDC Business Plan Scenario

	Gross Acreage	Use	Cumulative	1998	1999	2000	2001	2002	2003	2004
Land Sales Gross Acres										
Phase I: NE Area	16	R&D/Industrial	16		16					
Phase II: SE Area	30	Commercial	30			15	10	5		
Phase III: SW Area	35	R&D/Industrial	35			20	15			
Phase IV: NW Area	29	R&D/Industrial	29				10	19		
Phase IV: Center Area	40	R&D/Industrial	40						20	20
		Total	**150**	**0**	**16**	**35**	**35**	**24**	**20**	**20**
		Cumulative Total		0	16	51	86	110	130	150

Absorption -- Net Acres Efficiency: 80%

	Gross Acreage	Use	Cumulative	1998	1999	2000	2001	2002	2003	2004
Land Sales Gross Acres										
Phase I: NE Area	16	R&D/Industrial	12.8	0.0	12.8	0.0	0.0	0.0	0.0	0.0
Phase II: SE Area	30	Commercial	24.0	0.0	0.0	12.0	8.0	4.0	0.0	0.0
Phase III: SW Area	35	R&D/Industrial	28.0	0.0	0.0	16.0	12.0	0.0	0.0	0.0
Phase IV: NW Area	29	R&D/Industrial	23.2	0.0	0.0	0.0	8.0	15.2	0.0	0.0
Phase IV: Center Area	40	R&D/Industrial	32.0	0.0	0.0	0.0	0.0	0.0	16.0	16.0
		Total	**120.0**	**0.0**	**12.8**	**28.0**	**28.0**	**19.2**	**16.0**	**16.0**
		Cumulative Total		0.0	12.8	40.8	68.8	88.0	104.0	120.0

Cumulative Occupied Building Space										
New R&D/Industrial	0.35	FAR	1,463,616	-	195,149	243,936	304,920	231,739	243,936	243,936
New Commercial	0.25	FAR	261,360	-	-	130,680	87,120	43,560	-	-
		Total	**1,724,976**	**-**	**195,149**	**374,616**	**392,040**	**275,299**	**243,936**	**243,936**
		Cumulative Total		-	195,149	569,765	961,805	1,237,104	1,481,040	1,724,976
Development Revenues										
R&D/Industrial Land Sales	$3.00	per Sq.Ft. of Land	$12,545,280	$0	$1,672,704	$2,090,880	$2,613,600	$1,986,336	$2,090,880	$2,090,880
Commercial Land Sales	$6.00	per Sq.Ft. of Land	$6,272,640	$0	$0	$3,136,320	$2,090,880	$1,045,440	$0	$0
		Total	**$18,817,920**	**$0**	**$1,672,704**	**$5,227,200**	**$4,704,480**	**$3,031,776**	**$2,090,880**	**$2,090,880**
		Cumulative Total		$0	$1,672,704	$6,899,904	$11,604,384	$14,636,160	$16,727,040	$18,817,920

Source: City of Warren DATP EDC Application

Table 4.2. Business plan capital cost estimates.

LRA Business Plan Cost Estimates

LRA EDC Business Plan Scenario

	Subtotal	1998	1999	2000	2001	2002 Total	
Site Preparation - Demolition:							
Building	8,692,400	100%	0%	0%	0%	0%	100%
RR Track	309,200	100%	0%	0%	0%	0%	100%
Parking Lots	1,170,000	100%	0%	0%	0%	0%	100%
Steam Tunnels	400,000	40%	30%	10%	10%	10%	100%
Bridge	70,000	40%	30%	10%	10%	10%	100%
Test Track	950,000	40%	30%	10%	10%	10%	100%
Water Towers	32,000	40%	30%	10%	10%	10%	100%
Total Site Preparation	**11,623,600**	**10,752,400**	**435,600**	**145,200**	**145,200**	**145,200**	**11,623,600**
		40%	30%	10%	10%	10%	100%
Site Paving - Road System Demolition	1,035,000	414,000	310,500	103,500	103,500	103,500	1,035,000
Walks, Curbs, Fence and Retaining Walls Demolition	175,000	70,000	52,500	17,500	17,500	17,500	175,000
Seeding and Planting	450,000	180,000	135,000	45,000	45,000	45,000	450,000
Site Work - Demolition (Utilities)	1,328,600	531,440	398,580	132,860	132,860	132,860	1,328,600
Site Work - New Utilities	1,773,500	709,400	532,050	177,350	177,350	177,350	1,773,500
** **Total Site Infrastructure**	**4,762,100**	**1,904,840**	**1,428,630**	**476,210**	**476,210**	**476,210**	**4,762,100**
TOTAL	**16,385,700**	**12,657,240**	**1,864,230**	**621,410**	**621,410**	**621,410**	**16,385,700**
Capital Costs by Year	**100%**	**77%**	**11%**	**4%**	**4%**	**4%**	**100%**
General Contractor & Allowance	1,638,600	1,265,747	186,426	62,142	62,142	62,142	**1,638,600**
Contingency	1,810,400	1,398,455	205,972	68,657	68,657	68,657	**1,810,400**
Permits	204,300	157,813	23,244	7,748	7,748	7,748	**204,300**
Land Acquisition	160,000	160,000					**160,000**
GENERAL TOTAL	**20,199,000**	**15,639,255**	**2,279,872**	**759,957**	**759,957**	**759,957**	**20,199,000**

USACERL Note: Attempts were made by USACERL and BAE to recast the LRA's capital improvement plan according to the EDC application. However, total capital costs varied from just over $19 million to $23.6 million for what appears to be identical improvements. Table 4.2 therefore represents USACERL's and BAE's best effort in terms of capital costs found within the application and phasing found within the business plan (Appendix 7, Warren).

** DATP Cost for Total Site Infrastructure, on page 13 of the Application ($7,661,250), differs from the summation of the individual items.

Source: City of Warren DATP EDC Application

Table 4.3. LRA Scenario Pro Forma Summary

Detroit Arsenal Tank Plant EDC Development Cashflow
LRA EDC Business Plan Scenario

Item #			Cumulative	1998	1999	2000	2001	2002	2003	2004
	Development Revenues									
1	R&D/Industrial Land Sales		12,545,280	0	1,672,704	2,090,880	2,613,600	1,986,336	2,090,880	2,090,880
2	Commercial Land Sales		6,272,640	0	-	3,136,320	2,090,880	1,045,440	-	-
3	**Total Development Revenues**		**18,817,920**	-	**1,672,704**	**5,227,200**	**4,704,480**	**3,031,776**	**2,090,880**	**2,090,880**
4										
5	**Development Costs**									
6	Site Preparations		11,623,600	10,752,400	435,600	145,200	145,200	145,200		-
7	Site Paving		1,035,000	414,000	310,500	103,500	103,500	103,500	-	-
8	Walks, Curbs, Fence, etc.		175,000	70,000	52,500	17,500	17,500	17,500		
9	Utility Demolition		1,328,600	531,440	398,580	132,860	132,860	132,860		
10	Seeding and Planting		450,000	180,000	135,000	45,000	45,000	45,000		
11	Total New Utility Systems		1,773,500	709,400	532,050	177,350	177,350	177,350		
12	Off-site Land (Right-of-Way) Acquisition		160,000	160,000						
13	Engineering Design/Contractor Allowance		1,638,600	1,265,747	186,426	62,142	62,142	62,142		
14	Contingencies		1,810,400	1,398,455	205,972	68,657	68,657	68,657		
15	Permits		204,300	157,813	23,244	7,748	7,748	7,748		
16	**Total Development Costs**		**20,199,000**	**15,639,255**	**2,279,872**	**759,957**	**759,957**	**759,957**		
17										
18										
19	**Operations & Maintenance Costs**									
20	Land Sales Expenses		940,896	-	83,635	261,360	235,224	151,589	104,544	104,544
21	Presal Grounds Maintenance ($3000/acre)		1,774,500	525,000	469,000	346,500	224,000	140,000	70,000	-
22	**Total O & M**		2,715,396	525,000	552,635	607,860	459,224	291,589	174,544	104,544
23										
24	**Net Cashflow (1997 Dollars)**		**(4,096,476)**	**(16,164,255)**	**(1,159,803)**	**3,859,383**	**3,485,299**	**1,980,230**	**1,916,336**	**1,986,336**
25	Cumulative Cashflow			(16,164,255)	(17,324,059)	(13,464,676)	(9,979,378)	(7,999,148)	(6,082,812)	(4,096,476)
26	Cashflow with inflation rate of	4.0%		(16,810,825)	(1,254,443)	4,341,280	4,077,306	2,409,252	2,424,776	2,613,883
27										
28	**Present Value of Cash Flows at**	**15.0%**		(14,618,109)	(948,539)	2,854,462	2,331,213	1,197,824	1,048,298	982,655
29	**Net Present Value**		**$ (7,152,196)**							
30										
31	**Present Value of Cash Flows at**	**12.0%**		(15,009,666)	(1,000,035)	3,090,038	2,591,202	1,367,074	1,228,467	1,182,388
32	**Net Present Value**		**$ (6,550,531)**							
33										

Table 4.4. USACERL/BAE LRA Scenario Maximum Capital Costs.

USACERL/BAE Maximum Capital Costs
LRA EDC Business Plan Scenario

	Subtotal	1998	1999	2000	2001	2002 Total	
Site Preparation - Demolition:							
* Building	3,343,382	100%	0%	0%	0%	0%	100%
*Ashestos Removal	1,000,352	100%	0%	0%	0%	0%	100%
RR Track	522,000	100%	0%	0%	0%	0%	100%
Parking Lots	3,395,000	100%	0%	0%	0%	0%	
Steam Tunnels	459,000	40%	30%	10%	10%	10%	100%
Bridge	174,000	40%	30%	10%	10%	10%	100%
Test Track	734,000	40%	30%	10%	10%	10%	100%
Monorail	19,000	40%	30%	10%	10%	10%	
Water Towers	124,000	40%	30%	10%	10%	10%	100%
Total Site Preparation	**9,770,734**	**8,864,734**	**453,000**	**151,000**	**151,000**	**151,000**	**9,770,734**
		40%	30%	10%	10%	10%	100%
Site Paving - Road System	1,229,000	491,600	368,700	122,900	122,900	122,900	1,229,000
Walks, Curbs, Fence and Retaining Walls	253,000	101,200	75,900	25,300	25,300	25,300	253,000
Seeding and Planting	1,525,000	610,000	457,500	152,500	152,500	152,500	1,525,000
Site Work - Demolition (Utilities)	1,568,000	627,200	470,400	156,800	156,800	156,800	1,568,000
Site Work - New Utilities	1,734,000	693,600	520,200	173,400	173,400	173,400	1,734,000
** Total Site Infrastructure	6,309,000	2,523,600	1,892,700	630,900	630,900	630,900	6,309,000
TOTAL	**16,079,734**	**11,388,334**	**2,345,700**	**781,900**	**781,900**	**781,900**	**16,079,734**
Capital Costs by Year	**100%**	**71%**	**15%**	**5%**	**5%**	**5%**	**100%**
General Contractor & Allowance	-	-	-	-	-	-	-
Contingency	-	-	-	-	-	-	-
Permits	-	-	-	-	-	-	-
Land Acquisition	160,000	160,000					160,000
GENERAL TOTAL	**16,239,734**	**11,548,334**	**2,345,700**	**781,900**	**781,900**	**781,900**	**16,239,734**

***Based on the Corps of Engineers' DATP Appraisal Report and Detroit area demolition contractors.**

** DATP Cost for Total Site Infrastructure, on page 13 of the Application ($7,661,250), differs from the summation of the individual items.

Source: USACERL/BAE

Table 4.5. LRA Scenario with USACERL/BAE Costs and Offsets

Detroit Arsenal Tank Plant EDC Development Cashflow

LRA EDC Business Plan Scenario w/Maximum Cost Scenario

Item #			Cumulative	1998	1999	2000	2001	2002	2003	2004
	Development Revenues									
1	Building Lease Revenue		-	-	-	-	-	-	-	-
2	R&D/Industrial Land Sales		12,545,280	0	1,672,704	2,090,880	2,613,600	1,986,336	2,090,880	2,090,880
3	Commercial Land Sales		6,272,640	0	-	3,136,320	2,090,880	1,045,440	-	-
4	**Total Development Revenues**		18,817,920	-	1,672,704	5,227,200	4,704,480	3,031,776	2,090,880	2,090,880
5										
6	**Development Costs**									
7	Site Preparations		9,770,734	8,864,734	453,000	151,000	151,000	151,000		-
8	Site Paving		1,229,000	491,600	368,700	122,900	122,900	122,900	-	-
	Walks, Curbs, Fence, etc.		253,000	101,200	75,900	25,300	25,300	25,300		
	Seeding and Planting		1,525,000	610,000	457,500	152,500	152,500	152,500		
9	Utility Demolition		1,568,000	627,200	470,400	156,800	156,800	156,800		
10	Total New Utility Systems		1,734,000	693,600	520,200	173,400	173,400	173,400		
11	Off-site Land (Right-of-Way) Acquisition		160,000	160,000						
12	Engineering Design/Contractor Allowance		-	-	-	-	-	-		
13	Contingencies		-	-	-	-	-	-		
14	**Total Development Costs**		16,239,734	11,548,334	2,345,700	781,900	781,900	781,900		
15										
16	**Local Investment to Offset Development Costs**		6,000,000	5,000,000	1,000,000					
17										
18	**Operations & Maintenance Costs**									
19	Land Sales Expenses		940,896	-	83,635	261,360	235,224	151,589	104,544	104,544
20	Presal Grounds Maintenance		394,200	90,000	90,000	80,400	59,400	38,400	24,000	12,000
21	**Total O & M**		1,335,096	90,000	173,635	341,760	294,624	189,989	128,544	116,544
22										
23	**Net Cashflow (1997 Dollars)**		7,243,090	(6,638,334)	153,369	4,103,540	3,627,956	2,059,887	1,962,336	1,974,336
24	Cumulative Cashflow			(6,638,334)	(6,484,965)	(2,381,425)	1,246,531	3,306,418	5,268,754	7,243,090
25	Cashflow with inflation rate of	4.0%		(6,903,867)	165,884	4,615,924	4,244,195	2,506,168	2,482,981	2,598,091
26	**Net Present Value with discount rate of**	15.0%	$ 2,879,935							
27	Net Present Value without Offset		$ (2,459,649)							
28										
29	**Net Present Value with discount rate of**	12%	$ 3,806,128							
30	Net Present Value without Offset		$ (1,698,974)							
31										
32	Based on:									
33	USACERL Engineering cost Scenario:		Maximum							
34	BAE Adjustments:		No							

Table 4.6. CERL 1 Scenario Development Absorption.

Development Absorption

CERL 1 Scenario

	Gross Acreage	Use	Cumulative	1998	1999	2000	2001
Land Sales Gross Acres							
Phase I: Building 4	65.8	Industrial/Manufacturing	65.8	65.8			
Phase II: NE Area	5.3	R&D/Industrial	5.3		5.3		
Phase III: SW Area	42.8	R&D/Industrial	42.8		30.3	12.53	
Phase IV: NW Area	14	R&D/Industrial	14.0			14	
Phase IV: SE Area	25	R&D/Industrial	25.0				25
		Total	**152.93**	**65.8**	**35.6**	**26.53**	**25**
		Cumulative Total		65.8	101.4	127.93	152.93

Absorption --Gross Sq.Ft.

	Gross Acreage	Use	Cumulative	1998	1999	2000	2001
Land Sales Gross Acres							
Phase I: Building 4	65.8	Industrial/Manufacturing	1,107,109	1,107,109	-	-	-
Phase II: NE Area	5.3	R&D/Industrial	90,000	-	90,000	-	-
Phase III: SW Area	42.8	R&D/Industrial	755,000	-	535,000	220,000	-
Phase IV: NW Area	14	R&D/Industrial	220,000	-	-	220,000	-
Phase IV: SE Area	25	R&D/Industrial	345,000	-	-	-	345,000
		Total	**2,517,109**	**1,107,109**	**625,000**	**440,000**	**345,000**
		Cumulative Total		1,107,109	1,732,109	2,172,109	2,517,109
Cumulative Occupied Building Space							
New R&D/Industrial	1.00	FAR	1,410,000	-	625,000	440,000	345,000
Reuse Industrial/Manufacturing	1.00	FAR	1,107,109	1,107,109	-	-	-
		Total	**2,517,109**	**1,107,109**	**625,000**	**440,000**	**345,000**
		Cumulative Total		1,107,109	1,732,109	2,172,109	2,517,109
Development Revenues							
R&D/Industrial Land Sales	$2.50	per Sq.Ft. of Land	$9,488,457	$0	$3,876,840	$2,889,117	$2,722,500
Reuse Industrial/Manufacturing Land Sales	$0.00	per Sq.Ft. of Building	$0	$0	$0	$0	$0
		Total	**$9,488,457**	**$0**	**$3,876,840**	**$2,889,117**	**$2,722,500**
		Cumulative Total		$0	$3,876,840	$6,765,957	$9,488,457

Table 4.7. CERL1 capital cost estimates.

USACERL Cost Estimates

CERL 1 Scenario w/Maximum Costs

USACERL Scenario: Maximum

Action	Subtotal	1998	1999	2000	2001	2002	Total
Site Preparation - Demolition:	-						0%
* Building	1,338,994	100%	0%	0%	0%	0%	100%
RR Track	522,000	100%	0%	0%	0%	0%	100%
Parking Lots	3,395,000	100%	0%	0%	0%	0%	100%
Steam Tunnels	464,000	100%	0%	0%	0%	0%	100%
Bridge	174,000	0%	100%	0%	0%	0%	100%
Test Track	734,000	0%	100%	0%	0%	0%	100%
Crane	19,000	100%	0%	0%	0%	0%	100%
Water Towers	124,000	100%	0%	0%	0%	0%	100%
Total Site Preparation	**6,770,994**	**5,862,994**	**908,000**	-	-	-	**6,770,994**
	-	40%	30%	20%	10%	0%	100%
Site Paving - Road System Demolition	1,045,000	418,000	313,500	209,000	104,500	-	**1,045,000**
Site Paving - New Road System	1,573,000	629,200	471,900	314,600	157,300	-	**1,573,000**
Walks, Curbs, Fence and Retaining Walls: Demolition	253,000	101,200	75,900	50,600	25,300	-	**253,000**
Site Work - Demolition (Utilities)	1,564,000	625,600	469,200	312,800	156,400	-	**1,564,000**
Site Work - New Utilities	1,561,000	624,400	468,300	312,200	156,100	-	**1,561,000**
Total Site Infrastructure	**5,996,000**	**2,398,400**	**1,798,800**	**1,199,200**	**599,600**	-	**5,996,000**
General Contractor & Allowance	Included						
Contingency	Included						
Permits	Included	-					
	160,000						
	12,926,994	**8,261,394**	**2,706,800**	**1,199,200**	**599,600**	-	

*** Based on the Appraisals' Report and information from City of Warren's Contractors.**

Source: USACERL, 1997

Table 4.8. USACERL/BAE Building 4 fit-up costs.

Building 4 - Detroit Arsenal Tank Plant
CERL 1 Scenario w/Maximum Costs

		Total	Unit	Office	Industrial
	Gross Area:	1,107,109	SF	0	1,107,109
	Net Developable Area:	974,256	SF	0	974,256
7%	Mechanical Area:	77,498	SF	0	77,498
5%	Structure Area:	55,355	SF	0	55,355
	Assignable Area:	938,737	SF	0	938,737
	Occupancy:	2,581		0	1,836
	Existing Area:	1,107,109	SF		
	CERL Reuse Concept Description:				

Fit-up Cost Estimate		Quantity	Unit	Cost/Unit	CERL Cost	BAE %	BAE Cost
Major Mechanical/Utilities							
	Fire Protection	1,156,178	SF	$2.64	$3,052,309	0%	-
Office:							
	Plumbing Office/R&D	193,459	SF	$4.89	$946,824	0%	-
	HVAC Office/R&D	193,459	SF	$9.81	$1,898,232	0%	-
	Office/R&D Electrical Upgrade	193,459	SF	$5.80	$1,122,770	0%	-
Industrial:							
	Plumbing Special Manufacturing	974,256	SF	$2.30	$2,240,789	0%	-
	HVAC Special Manufacturing	974,256	SF	$3.59	$3,497,579	100%	3,497,579
	Special Manufacturing Electrical Upgrade	974,256	SF	$2.86	$2,786,372	0%	-
Interior Construction							
3 ea	Area separation walls	1,806	LF	$423.60	$765,022	0%	-
	Office Lighting	193,459	SF	$5.22	$1,009,070	0%	-
	Office/R&D Office Construction	193,459	SF	$0.00	$0	0%	-
	Restroom Group	54	EA	$2,578.16	$139,221	0%	-
	Floor Construction	109,920	SF	$17.21	$1,891,386	0%	-
0.05	Concrete Floor on Grade	48,713	SF	$3.38	$164,653	100%	164,653
1 fl	Stairs	6	EA	$3,340.79	$20,045	0%	-
Interior Demolition							
5%	Cages & steel stacks	55,355	SF	$3.80	$210,349	0%	-
Elevator 2 stop		3	EA	$55,283.23	$165,850	0%	-
Exterior Envelope Repairs							
6 ea	New expansion joints w/curb	3,612	LF	$0.00	$0	100%	-
	Roof replacement	285,000	SF	$5.50	$1,567,500	100%	1,567,500
	Loading docks	30	EA	$15,156.00	$454,680	0%	-
Sub-Total					**$31,188,368**		**5,229,732**
10% Contingency					**$38,985,461**		**$5,752,705**
30% Contingency					**$46,782,553**		**$6,798,652**

Table 4.9. CERL 1 Scenario Summary.

Detroit Arsenal Tank Plant EDC Development Cashflow

CERL 1 Scenario w/Maximum Costs

Item #			Cumulative	1998	1999	2000	2001	2002	2003	2004
	Development Revenues									
1	Building Lease Revenue		10,141,118	10,141,118	-	-	-	-	-	-
2	R&D/Industrial Land Sales		9,488,457	0	3,876,840	2,889,117	2,722,500	-	-	-
3	Commercial Land Sales		-	0	-	-	-	-	-	-
4	**Total Development Revenues**		**19,629,575**	**10,141,118**	**3,876,840**	**2,889,117**	**2,722,500**	-	-	-
5	Cumulative Revenue			10,141,118	14,017,958	16,907,075	19,629,575	19,629,575	19,629,575	19,629,575
6	**Development Costs**									
7	Building 4 Fitup Costs		6,798,652	6,798,652						
8	Site Preparations		6,770,994	5,862,994	908,000	-	-	-		
9	Site Paving		2,871,000	1,148,400	861,300	574,200	287,100	-	-	-
10	Utility Demolition		1,564,000	625,600	469,200	312,800	156,400	-		
11	Total New Utility Systems		1,561,000	624,400	468,300	312,200	156,100	-		
12	Off-site Land (Right-of-Way) Acquisition		160,000	160,000						
13	Engineering Design/Contractor Allowance		-	-	-	-	-	-	-	
14	Contingencies		-	-	-	-	-	-		
15	**Total Development Costs**		**19,725,646**	**15,220,046**	**2,706,800**	**1,199,200**	**599,600**	-		
16										
17	**Local Investment to Offset Development costs**		**6,000,000**	**5,000,000**	**1,000,000**					
18										
19	**Operations & Maintenance Costs**									
20	Land Sales Expenses		981,479	507,056	193,842	144,456	136,125	-	-	-
21	Presale Grounds Maintenance		189,954	91,758	52,278	30,918	15,000	-	-	-
22	**Total O & M**		1,171,433	598,814	246,120	175,374	151,125	-	-	-
23										
24	**Net Cashflow (1997 Dollars)**		**4,732,497**	**(677,741)**	**1,923,920**	**1,514,543**	**1,971,775**	-	-	-
25	Cumulative Cashflow			(677,741)	1,246,179	2,760,722	4,732,497	4,732,497	4,732,497	4,732,497
26	Cashflow with inflation rate of	4%		(704,851)	2,080,912	1,703,655	2,306,698	-	-	-
27	**Net Present Value with discount rate of**	**15%**	**3,399,598**							
28	Net Present Value without Offset		$ (1,939,987)							
29										
30	**Net Present Value with discount rate of**	**12%**	**$ 3,708,135**							
31	Net Present Value without Offset		$ (1,796,967)							
32										
33	Based on:									
34	USACERL Engineering cost Scenario:		Maximum							
35	BAE Adjustments:		No							

Table 4.10. CERL2 Scenario Summary.

Detroit Arsenal Tank Plant EDC Development Cashflow

CERL 2 Scenario w/ Maximum CERL/BAE Cost

Item #			Cumulative	1998	1999	2000	2001	2002	2003	2004
	Development Revenues									
1	Building Lease Revenue		10,141,118	10,141,118	-	-	-	-	-	-
2	R&D/Industrial Land Sales		11,386,148	0	4,652,208	3,466,940	3,267,000	-	-	-
3	Commercial Land Sales		-	0	-	-	-	-	-	-
4	**Total Development Revenues**		**21,527,267**	**10,141,118**	**4,652,208**	**3,466,940**	**3,267,000**	-	-	-
5	Cumulative Revenue			10,141,118	14,793,326	18,260,267	21,527,267	21,527,267	21,527,267	21,527,267
6	**Development Costs**									
7	Building 4 Fitup Costs		6,798,652	6,798,652						
8	Site Preparations		6,770,994	5,862,994	908,000	-	-	-		-
9	Site Paving		2,871,000	1,148,400	861,300	574,200	287,100	-	-	-
10	Utility Demolition		1,564,000	625,600	469,200	312,800	156,400	-		
11	Total New Utility Systems		1,561,000	624,400	468,300	312,200	156,100	-		
12	Off-site Land (Right-of-Way) Acquisition		160,000	160,000						
13	Engineering Design/Contractor Allowance		-	-	-	-	-	-		
14	Contingencies		-	-	-	-	-	-		
15	**Total Development Costs**		**19,725,646**	**15,220,046**	**2,706,800**	**1,199,200**	**599,600**	-		
16										
17	**Local Investment to Offset Development Costs**		**6,000,000**	**5,000,000**	**1,000,000**					
18										
19	**Operations & Maintenance Costs**									
20	Land Sales Expenses		1,076,363	507,056	232,610	173,347	163,350	-	-	-
21	Presale Grounds Maintenance		189,954	91,758	52,278	30,918	15,000	-	-	-
22	**Total O & M**		1,266,317	598,814	284,888	204,265	178,350	-	-	-
23										
24	**Net Cashflow (1997 Dollars)**		**6,535,304**	**(677,741)**	**2,660,520**	**2,063,475**	**2,489,050**	-	-	-
25	Cumulative Cashflow			(677,741)	1,982,779	4,046,254	6,535,304	6,535,304	6,535,304	6,535,304
26	Cashflow with inflation rate of	4%		(704,851)	2,877,618	2,321,129	2,911,836	-	-	-
27	**Net Present Value with discount rate of**	15.0%	**$ 4,754,011**							
28	Net Present Value without Offset		$ (585,573)							
29										
30	**Net Present Value with discount rate of**	12.0%	**$ 5,167,347**							
31	Net Present Value without Offset		$ (337,755)							
32										
33	Based on:									
34	USACERL Engineering cost Scenario:		Maximum							
35	BAE Adjustments:		No							

Table 4.11. CERL3 scenario development absorption.

Development Absorption

CERL 3 Scenario

	Gross Acreage	Use	Cumulative	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Land Sales Gross Acres															
Phase I: Building 4	65.8	Industrial/Man	65.8	65.8											
Phase II: NE Area	5.3	R&D/Industria	5.0				5								
Phase III: SW Area	42.8	R&D/Industria	42.8					10	10	10	12.8				
Phase IV: NW Area	14	R&D/Industria	14.0									14			
Phase IV: SE Area	25	R&D/Industria	25.0										5	10	10
		Total	152.6	65.8	0	0	5	10	10	10	12.8	14	5	10	10
		Cumulative Total		65.8	65.8	65.8	70.8	80.8	90.8	100.8	113.6	127.6	132.6	142.6	152.6
rption -- Net Acres Efficiency:	80%														
	ross Acreage	Use	Cumulative	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Land Sales Gross Acres															
Phase I: Building 4	65.8	Industrial/Man	1,107,109	1,107,109	.	.	.	.	.	.	.	.	0.0	0.0	0.0
Phase II: NE Area	5.3	R&D/Industria	4	.	.	.	4	.	.	.	.	.	.	.	.
Phase III: SW Area	42.8	R&D/Industria	34	.	.	.	.	8	8	8	10	.	.	.	.
Phase IV: NW Area	14	R&D/Industria	11	.	.	.	.	.	.	.	.	11	.	.	.
Phase IV: SE Area	25	R&D/Industria	20	.	.	.	.	.	.	.	.	.	4	8	8
		Total	1,107,178	1,107,109	.	.	4	8	8	8	10	11	4.0	8.0	8.0
		Cumulative Total		1,107,109	1,107,109	1,107,109	1,107,113	1,107,121	1,107,129	1,107,137	1,107,147	1,107,158	1107162.4	1107170.4	1107178.4
Cumulative Occupied Building Space															
New R&D/Industrial	0.40	FAR	1,209,923	.	.	.	69,696	139,392	139,392	139,392	178,422	195,149	69,696	139,392	139,392
Reuse Industrial/Manufacturing	1.00	FAR	1,107,130	1,107,109	.	.	.	.	.	.	10	11	.	.	.
		Total	2,317,053	1,107,109	.	.	69,696	139,392	139,392	139,392	178,432	195,160	69,696	139,392	139,392
		Cumulative Total		1,107,109	1,107,109	1,107,109	1,176,805	1,316,197	1,455,589	1,594,981	1,773,413	1,968,573	2,038,269	2,177,661	2,317,053
Cumulative Employment															
New R&D/Industrial	550	Sq. Ft./Emplo	2,195	.	.	.	126	253	253	253	324	354	126	253	253
New Commercial	550	Sq. Ft./Emplo	2,012	2,012	.	.	.	.	.	.	.	.	.	.	.
		Total	4,207	2,012	.	.	126	253	253	253	324	354	126	253	253
		Cumulative Total		2,012	2,012	2,012	2,138	2,391	2,644	2,897	3,221	3,575	3,701	3,954	4,207
Development Revenues															
R&D/Industrial Land Sales	$3.00	per Sq.Ft. of	$11,343,024	$0	$0	$0	$653,400	$1,306,800	$1,306,800	$1,306,800	$1,672,704	$1,829,520	$653,400	$1,306,800	$1,306,800
Reuse Industrial/Manufacturing	$0.00	per Sq.Ft. of	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
		Total	$11,343,024	$0	$0	$0	$653,400	$1,306,800	$1,306,800	$1,306,800	$1,672,704	$1,829,520	$653,400	$1,306,800	$1,306,800
		Cumulative Total		$0	$0	$0	$653,400	$1,960,200	$3,267,000	$4,573,800	$6,246,504	$8,076,024	$8,729,424	$10,036,224	$11,343,024

Source: City of Warren DATP EDC Application

Table 4.12. CERL3 scenario summary.

Detroit Arsenal Tank Plant EDC Development Cashflow

CERL 3 Scenario w/Maximum Costs

Item #			Cumulative	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	Development Revenues														
1	Building Lease Revenue		10,141,118	10,141,118											
2	R&D/Industrial Land Sales		10,036,224	0			653,400	1,306,800	1,306,800	1,306,800	1,672,704	1,829,520	653,400	1,306,800	1,306,800
3	Commercial Land Sales		-	0	-	-	-	-	-	-	-	-	-	-	-
4	**Total Development Revenues**		20,177,342	10,141,118	-	-	653,400	1,306,800	1,306,800	1,306,800	1,672,704	1,829,520	653,400	1,306,800	1,306,800
5	Cumulative Revenue			10,141,118	10,141,118	10,141,118	10,794,518	12,101,318	13,408,118	14,714,918	16,387,622	18,217,142	18,870,542	20,177,342	21,484,142
6	**Development Costs**														
7	Building 4 Fitup Costs		6,798,652	6,798,652											
8	Site Preparations		6,770,994	5,862,994	908,000	-	-	-							
9	Site Paving		2,871,000	1,148,400	861,300	574,200	287,100	-							
10	Utility Demolition		1,564,000	625,600	469,200	312,800	156,400	-							
11	Total New Utility Systems		1,561,000	624,400	468,300	312,200	156,100	-							
12	Off-site Land (Right-of-Way) Acquisition		160,000	160,000											
13	Engineering Design/Contractor Allowance		-	-	-	-	-	-							
14	Contingencies		-	-	-	-	-	-							
15	**Total Development Costs**		19,725,646	15,220,046	2,706,800	1,199,200	599,600	-	-	-	-	-	-	-	-
16															
17	**Local Investment to Offset Development Costs**		6,000,000	5,000,000			1,000,000								
18															
19	**Operations & Maintenance Costs**														
20	Land Sales Expenses		1,008,867	507,056	-	-	32,670	65,340	65,340	65,340	83,635	91,476	32,670	65,340	65,340
21	Presale Grounds Maintenance		458,520	91,560	52,080	52,080	52,080	49,080	43,080	37,080	31,080	23,400	15,000	12,000	6,000
22	**Total O & M**		1,467,387	598,616	52,080	52,080	84,750	114,420	108,420	102,420	114,715	114,876	47,670	77,340	71,340
23															
24	**Net Cashflow (1997 Dollars)**		6,219,770	(677,543)	(2,758,880)	(1,251,280)	969,050	1,192,380	1,198,380	1,204,380	1,557,989	1,714,644	605,730	1,229,460	1,235,460
25	Cumulative Cashflow			(677,543)	(3,436,423)	(4,687,703)	(3,718,653)	(2,526,273)	(1,327,893)	(123,513)	1,434,476	3,149,120	3,754,850	4,984,310	6,219,770
26	Cashflow with inflation rate of	4%		(704,645)	(2,984,005)	(1,407,520)	1,133,651	1,450,713	1,516,333	1,584,882	2,217,504	2,538,092	932,494	1,968,405	1,978,011
27	**Net Present Value with discount rate of**	15.0%	$ 1,295,948												
28	Net Present Value without Offset		$ (3,894,662)												
29															
30	**Net Present Value with discount rate of**	12.0%	$ 2,203,636												
31	Net Present Value without Offset		$ (3,182,687)												
32															
33	Based on:														
34	USACERL Engineering cost Scenario:		Maximum												
35	BAE Adjustments:		no												

Table 4.13. Scenario and sensitivity analysis.

Detroit Arseral Tank Plant
Scenario and Sensitivity Analysis Table - Range of Scenario NPVs

Scenario - LRA EDC Application Business Plan	Total Revenues	Total Operating Costs	Total Operating Cash Flow	Total Capital Costs	Total Cash Flow	Net Present Value Discount Rate 15%	12%
Total Project Analysis View							
Cash Flow with LRA capital costs	18,817,920	2,715,396	16,102,524	20,199,000	(4,096,476)	($7,152,196)	($6,550,531)
Project Analysis with USACERL/BAE Maximum Costs							
Cash Flow with reduced capital costs	18,817,920	1,335,096	17,482,824	16,239,734	1,243,090	($2,459,649)	($1,698,974)
Project Analysis with Capital Cost Offsets							
Cash flow with capital cost offsets applied in 1998 and 1999	18,817,920	1,335,096	17,482,824	16,239,734	7,243,090	$2,879,935	$3,806,178
CERL1 - Reuse of Building 4							
Total Project Analysis View							
Cash Flow with USACERL/BAE Capital Costs	19,629,575	1,171,433	18,458,142	19,725,646	(1,267,503)	($1,939,987)	($1,796,967)
Project Analysis with Capital Cost Offsets							
Cash flow with capital cost offsets applied in 1998 and 1999	19,629,575	1,171,433	18,458,142	19,725,646	4,732,497	$3,399,598	$3,708,135
CERL2 - Reuse of Building 4 plus BAE Revenues							
Total Project Analysis View							
Cash Flow with USACERL/BAE Capital Costs plus increases revenues	21,527,767	1,266,317	20,260,950	19,725,646	535,304	($585,573)	($337,755)
Project Analysis with Capital Cost Offsets							
Cash flow with capital cost offsets applied in 1998 and 1999	21,527,267	1,266,317	20,260,950	19,725,646	6,535,304	$4,754,011	$5,167,347
CERL3 - Environmentally Encumbered Scenario							
Total Project Analysis View							
Cash Flow with USACERL/BAE Capital Costs plus extended absorption	20,177,342	1,467,387	18,709,955	19,725,646	219,770	($3,894,662)	($3,182,687)
Project Analysis with Capital Cost Offsets							
Cash flow with capital cost offsets applied in 1998 and 1999	20,177,342	1,467,387	18,709,955	19,725,646	6,219,770	$1,295,948	$2,203,636

CONCLUSION: USACERL and BAE conclude that the LRA business plan is ***financially feasible*** under a range of scenarios when capital improvement offsets are applied. Because of the lack of information concerning environmental clean-up timelines, likely resue scenarios based on the 11 development proposals, and weakly supported capital costs at the time of the technical review, USACERLand BAE feel it is inappropriate to offer a final range of estimated net present value. Rather, this table should serve as a guide during negotiations with the City of Warren when more information on these concerns is hopefully available.

5 Need and Extent of Proposed Infrastructure Improvements

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Objective

The objective of this chapter is twofold: (1) to evaluate the need for proposed infrastructure improvements required to encourage investment and job creation, which are contained in the DATP EDC business plan and 1997 DATP Comprehensive Reuse Plan, and (2) to determine if estimated costs fall within a range of reasonableness based on industry standards and local construction cost factors.

Approach

USACERL's general approach to determine the need and extent of proposed infrastructure improvements was similar to other EDC reviews. USACERL engineers conducted a site visit to DATP during the week of 17 July 1997 to observe current infrastructure conditions, distresses, and capacity contained within the 153-acre EDC parcel. From this evaluation, the team was then able to establish the current carrying capacity and indicated life cycle of infrastructure systems based on generally accepted engineering management principals. With an infrastructure condition baseline established, USACERL attempted to independently validate the reasonableness of the DATP's infrastructure program and associated costs on an individual improvement basis. (See Appendix A for technical support for infrastructure improvement cost estimates.)

Background

The City of Warren, acting as the approved LRA, proposed two strategies for the redevelopment of DATP.* The LRA is proposing over *$20 million* in infrastructure improvements (Strategy One) and over *$17 million* (Strategy Two) in improvements over 5 years to bring the 153 acres contained within the EDC parcel to a code-compliant, marketable, and functional standard for the expressed purpose of job creation. Table 5.1 summarizes the infrastructure improvement programs contained in the EDC Business Plan and Reuse Plan, and also serves as the starting point for USACERL's analysis.

* Strategy 1 is found in the EDC application in addition to the DATP Comprehensive Reuse Plan, and is assumed to be the LRA's preferred redevelopment strategy Alternatively, Strategy 2 could only be found in the Reuse Plan.

Table 5.1. Summary of the LRA's infrastructure improvement strategies.

Capital Improvement	Strategy One	Strategy Two
Site infrastructure	$4,762,100	$11,145,800
Building demolition	$11,623,600	$2,704,800
Land acquisition allowance	$160,000	$160,000
Contingency and allowance	$3,653,300	$3,091,500
Total	**$20,199,000**	**$17,102,100**

In general, the primary development objective of Strategy 1 is to create a flexible industrial park that is responsive to market forces. This objective is proposed to be accomplished through the systematic demolition of all existing buildings and site utilities, in addition to the construction of new utility trunk lines for domestic water, wastewater, storm water, and natural gas. Alternatively, Strategy 2 proposes the reuse of the 1.1-million-sq-ft Building 4, which would naturally reduce demolition costs and perhaps generate a more rapid reuse of the subject property. Like Strategy 2, however, all remaining utilities and buildings would be demolished to accommodate new development and trunk line utilities.

In Table 5.1, building demolition expenses include the removal of 24 buildings (including Building 4) under Strategy 1 and 20 buildings under Strategy 2; the removal of the 1.1-mile test track and bridge; water tower and tanks; railroad track and ties; parking lots; and abandoned steam tunnels. Site infrastructure includes the construction of a new road system, walks, curbs, and retaining walls; the removal of underground utilities; landscaping; and the installation of new utility systems.

The largest component of Strategy 1 is building demolition at a cost of *$11.6 million*, due largely to the demolition of Building 4, which has an area of over 1.1 million sq ft. The largest component of Strategy Two is site infrastructure at a cost of *$11.2 million*. Note that building fit-up costs are included in this improvement strategy.

The EDC application and business plan stated that the costs associated with demolition activities should be absorbed by revenues generated by land sales. The cost of *$1.8 million* to replace the existing utility systems with a new sanitary and storm sewer, and new water and gas lines is anticipated to be, in part, funded by the City of Warren's (DDA).

For both strategies, the only off-site improvement proposed is the direct southerly access to the I-696 Service Drive, which will cross privately owned

property (approximately 1.6 acres). The anticipated acquisition expense of *$160,000* will be absorbed by the City of Warren.

Infrastructure Findings

Cost Analysis and Findings

As stated earlier, USACERL uses a two-tier analysis that first evaluates the associated costs of the proposed infrastructure program based on industry standards and local cost factors within the context of baseline infrastructure conditions. Based on the two development strategies proposed by the LRA, and on information gathered from several redevelopment proposals submitted under an RFP, USACERL developed cost estimates for Strategies 1 and 2.* For each item presented, USACERL estimates a range of cost reasonableness providing a minimum and a maximum cost for each line item.

Development Strategy 1

The general assumptions of Development Strategy 1 are: (1) that the Army will retain Buildings 7 and 8 temporarily, (2) land should be acquired south of the site to ensure access to I-696, and (3) all buildings and infrastructure, including Building 4, will be demolished to clear the site for a flexible industrial park.† Table 5.2 summarizes USACERL's cost estimates for this Strategy.

Table 5.2. Cost comparisons for improvements in the LRA business plan - Strategy 1.

Scenario Proposed by the LRA - Strategy One	LRA Cost	USACERL Cost	
		Minimum	Maximum
Site preparation - demolition			
Building	$8,692,400	$3,343,382	$3,343,382
Asbestos removal	-	$571,630	$1,000,352
Railroad track	$309,200	$441,000	$522,000
Parking lots	$1,170,000	$1,170,000	$3,395,000
Steam tunnels	$400,000	$388,000	$459,000
Bridge	$70,000	$147,000	$174,000

* See Chapter 4, **Business Plan Review and Market and Financial Feasibility Analysis**, and Chapter 6, **Extent of State and Local Investment and Risk**, for discussions on the City of Warren's RFP for the redevelopment of DATP.

† The LRA has indicated an intent to initially redevelop the site under the Michigan Condominium Act (MCLA 559.101) which would purportedly permit a rapid property transfer and would provide the City with a substantial degree of control over development consistent with flexible industrial park objectives.

Scenario Proposed by the LRA - Strategy One	LRA Cost	USACERL Cost	
		Minimum	Maximum
Test track	$950,000	$621,000	$734,000
Monorail	$0	$16,000	$19,000
Water towers	$32,000	$104,000	$124,000
Total site preparation	$11,623,600	$6,802,012	$9,770,734
Site infrastructure			
Site paving - road system	$1,035,000	$1,039,000	$1,229,000
Walks, curbs, fence, and retaining walls	$175,000	$214,000	$253,000
Seeding and planting	$450,000	$1,291,000	$1,525,000
Site work - demolition (utilities)	$1,328,600	$1,327,000	$1,568,000
Site work - new utilities	$1,773,500	$1,467,000	$1,734,000
Total site infrastructure	$4,762,100	$5,338,000	$6,309,000
TOTAL	**$16,385,700**	**$12,140,012**	**$16,079,734**
General contractor and allowance	$1,638,600	Included	Included
Contingency	$1,810,400	Included	Included
Permits	$204,300	Included	Included
Land acquisition	$160,000	$160,000	$160,000
GENERAL TOTAL	**$20,199,000**	**$12,300,012**	**$16,239,734**

USACERL Strategy 1 Findings

Unlike most EDC application submissions reviewed by USACERL, the capital costs presented in the EDC business plan lacked the necessary detail and internal consistency required to perform a rigorous cost analysis. During the course of the technical review, USACERL noted the following capital improvement plan deficiencies:

- total capital costs varied from slightly over *$19 million* (pp 19-21) to *$23.6 million* in Appendix 7
- groups of costs (e.g., site infrastructure) varied, making it difficult to determine which costs should be included in the final analysis and what group they should be placed in
- many line items lacked necessary detail in terms of capital cost locations and engineering details
- quantities of site demolition and new utilities for apparently identical improvements varied between Strategy 1 and 2 with no underlying support.

These limitations were partially mitigated, however, through discussions with Ed Servitto, the Assistant Attorney for the City of Warren, and USACERL's independent expertise in military base redevelopment. Therefore, the primary

caveat for the findings presented in this chapter is that they were developed with an inadequately developed capital improvement plan and USACERL's independent assumptions.

Site Preparation Costs and Findings

When USACERL reconciled site preparation costs, it was revealed that the EDC application programmed *$11,623,600* for this major cost category. USACERL's independent assessment suggests that a more appropriate cost range would be between *$6,802,012* and *$9,770,734*. More specifically, USACERL took exception to the following site preparation costs.

Building demolition – Demolition costs were provided to the Corps of Engineers' contract appraiser by Patrick Wurtzel of Bierlein Demolition Contractors of Midland, MI. Mr. Wurtzel personally inspected the property and gave the appraisers a demolition estimate (net of salvage value) of *$3,343,382*. He stated a willingness to contract with the City of Warren for that amount. In USACERL's opinion, standard demolition cost modeling is inappropriate for the analysis at DATP and requires the use of local area demolition expertise for two reasons.

First, because of Detroit's automobile manufacturing legacy, there are many buildings of similar size and design as those found at DATP, especially Building 4, which are demolished on a routine basis. The frequency of such large-scale demolition projects means that economies of scale for both demolition and salvageable material exist which cannot be appropriately captured by USACERL's standardized cost models. Second, local area demolition contractors are subject to market competition and, as such, must be as cost effective as possible. In sum, the use of contractor estimates in the case of DATP is nearly ideal to determine realistic costs for a unique demolition project.

Because the above cost estimate offered by Mr. Wurtzel did not include specific costs for lead-based paint and asbestos abatement, USACERL investigated likely costs for DATP. To assist with a reasonable per square foot abatement cost, USACERL relied upon Bierlein Demolition Contractors, who suggested a cost of $0.40 to $0.70 per sq ft. Thus, the total building demolition cost, considering asbestos removal, is between *$3,915,000* and *$4,343,734*. Based on these estimates, USACERL finds that the LRA's Building Demolition cost of *$8,692,400* is likely overestimated.

Parking lots – Due to the lack of information about the measurable area considered by the LRA as parking lots, and due to the unique parking and road

systems at the DATP, USACERL relied upon its best judgement to determine total parking demolition costs. In the absence of quantities and locations, USACERL performed independent quantity take-offs based on DATP site plans and concluded that nearly 1,400,000 sq ft of parking lot space would likely require demolition in order to implement reuse plan phasing effectively. Based on this quantity, USACERL estimated a maximum cost of *$3,395,000*, which served as the "maximum" parking lot demolition cost. Alternatively, USACERL relied upon the LRA's estimate of *$1,170,000*, assuming that the applicant had conducted the requisite level of measurement and analysis to develop a defensible cost estimate. As stated, however, no specific engineering support was provided in any referenced source.

Miscellaneous items – The demolition of the railroad track, steam tunnels, bridge, test track, crane, and water towers were grouped as one item. USACERL estimates that the cost of removing these items would be in the range of *$1,717,000* to *$2,032,000*, which generally supports the LRA's cost estimate of *$1,761,200*.

Site Infrastructure Costs and Findings

The LRA determined that the total cost estimated for Site Infrastructure is *$4,762,100* under Strategy 1, which is comparatively less than USACERL's cost range of *$5,338,000* to *$6,309,000*. The following items are responsible for the apparent discrepancy.

Seeding and planting – The largest difference in cost estimates between the LRA and USACERL under site infrastructure costs is the seeding and planting line item. This difference is likely because the LRA determined the cost based only on the hydroseed process, while USACERL includes in the process steps such as borrowing, hauling, and spreading new topsoil to facilitate the hydroseed process. The LRA cost of *$450,000* appears too low compared to USACERL's range of *$1,291,000* to *$1,525,000*. Again, in the absence of detailed cost estimates, USACERL was compelled to make independent assumptions for this item based on the project description and generally accepted site work procedures for accomplishing the stated project.

Miscellaneous items – The LRA cost estimates also did not account for the demolition of the existing road system. Recall that the LRA proposes the demolition of all existing site improvements under Strategy 1, which would necessarily require the demolition of the existing road network. Therefore, even though USACERL estimated the cost to demolish the existing road system to be between *$884,000* and *$1,045,000*, the cost was not included in the Strategy 1

table in order to maintain analysis consistency. Based on the minimal size of the existing road network, it could be reasonably assumed that demolition would be a cost borne by a developer and these costs would be incorporated, in part, in parking lot demolition costs.

The cost assigned for walks, curbs, fence, and retaining walls was questionable in terms of scope of work. While there is no need to build fences or retaining walls on the site, there is a need to demolish the existing fences and the sound barrier wall on the test track in order to create a site consistent with the LRA's industrial park objectives.

Finally, the cost associated with curbs and gutters is usually included on the cost to build new roads, but the LRA failed to assign a cost to demolish the existing network at DATP. Therefore, USACERL assigned a demolition cost for these structures. With these considerations in mind, if all site infrastructure costs are totaled, except for seeding and planting, the LRA estimate of *$4,311,500* falls within USACERL's range of reasonableness, which is *$4,047,000* to *$4,784,000*.

USACERL Strategy 2 Findings

The capital improvement assumptions of Strategy 2 are generally similar to the ones discussed in Strategy 1, except for the proposed reuse of Buildings 1, 2, 3, and 4. Notably, USACERL developed this scenario after examining actual redevelopment proposals solicited by the City of Warren through its RFP process. Review of the strongest proposals as defined by City officials, revealed the common thread of reusing the 1.1-million-sq-ft Building 4. For this reason, USACERL estimated costs associated with the development of the site reusing Building 4 and demolishing all other buildings.

Some of the LRA cost estimates were adjusted to bring them into line with the "modified" Strategy 2, which is more reflective of the development strategies found in the proposals. For instance, the cost of $335,000 to demolish Buildings 1, 2, and 3 was added to the LRA's original Strategy 2 building demolition cost of $1,161,000. Similarly, the cost of $2,406,700 to renovate Buildings 1, 2, and 3 was subtracted from the total cost of LRA's Building Renovation estimates. It is important to note that the LRA's Strategy 2 in its modified form served as the basis for CERL1, 2, and 3 scenarios contained in Chapter 4, **Business Plan Review and Market and Financial Feasibility Analysis**. Table 5.3 summarizes USACERL's cost estimates for this scenario.

Table 5.3. Cost comparisons for improvements in the LRA reuse plan - Strategy 2 - CERL1, 2, and 3 scenarios.

Land use StrategyTwo/CERL1, 2, and 3.	LRA Cost	USACERL Cost	
		Minimum	Maximum
Site preparation - demolition:			
Building	$1,496,184	$1,206,836	$1,338,994
Railroad track	$91,600	$441,000	$522,000
Parking lots		$1,170,000	$3,395,000
Steam tunnels	$400,000	$388,000	$460,000
Bridge	$70,000	$147,000	$174,000
Test track	$950,000	$621,000	$734,000
Crane		$16,000	$19,000
Water towers	$32,000	$104,000	$124,000
Total site preparation	**$3,039,784**	**$4,093,836**	**$6,766,994**
Site infrastructure			
Site paving - road system demolition		$884,000	$1,045,000
Site paving - new road system	$608,000	$1,329,000	$1,573,000
Walks, curbs, fence, and retaining walls	$103,000	$214,000	$253,000
Seeding and planting	$320,000	$817,000	$966,000
Site work - demolition (utilities)	$906,900	$1,327,000	$1,568,000
Site work - new utilities	$1,065,700	$1,321,000	$1,561,000
Total site infrastructure	**$3,003,600**	**$5,892,000**	**$6,966,000**
Fit up for Building 4	**$5,535,500**	**$5,752,705**	**$6,798,652**
TOTAL	**$11,578,884**	**$15,734,541**	**$20,527,646**
General contractor and allowance	$1,157,888	Included	Included
Contingency	$1,273,677	Included	Included
Permits	$172,000	Included	Included
Land acquisition	$160,000	$160,000	$160,000
GENERAL TOTAL	**$14,342,450**	**$15,894,541**	**$20,687,646**

Site Preparation: Costs and Findings

Under Strategy 2, the applicant determines that the total estimated cost for site preparation is *$3,039,784*. In contrast, USACERL's costs range from *$4,093,836* to *$6,767,994*. However, it was observed that the LRA failed to account for parking lot demolition or for asbestos removal, which would account for the lower site preparation cost estimates. These and other items are discussed in more detail in the following sections.

Building demolition – USACERL's building demolition cost estimates for Strategy 2 were generated in the same manner as in Strategy 1; they rely on the demolition cost estimate of *$3,343,382*, which was provided by Bierlein Demoli-

tion Contractors. This estimate was adjusted by calculating a cost per square foot and then using this figure to estimate the building demolition cost for all buildings except Building 4. Again, USACERL added in the cost for asbestos removal. Thus, the total cost of building demolition is between *$1,207,000* and *$1,339,000*. Based on the foregoing, USACERL finds that the LRA's building demolition cost of *$1,496,000* is overestimated.

Parking lots – USACERL used the same cost estimation procedure for parking lot demolition in Strategy 2 as was used in Strategy 1. Accordingly, the range of likely parking lot demolition costs under Strategy 2 range from *$1,170,000* to *$3,395,000*.

Railroad tracks – This site preparation item posed significant evaluation challenges for USACERL. No potential reuses of the on-site rail network were indicated by the LRA or in the development proposals reviewed by USACERL. Nevertheless, under Strategy 1, the LRA programs the demolition of nearly 13,500 linear feet (LF) of rails and ties, while Strategy 2 only programs the removal of 4,000 LF. In the absence of any additional information or a discussion of rail need, USACERL elected to use the rail demolition quantity under Strategy 1, which was *$309,200*. USACERL's independent estimates indicate that the range of likely costs to accomplish the demolition of 13,500 LF of on-site rail would be from *$441,000* to *$522,000*.

Miscellaneous items – As was the case for Strategy 1, the demolition of the railroad track, steam tunnels, bridge, test track, crane, and water towers were grouped into just one capital improvement line item. USACERL's cost estimates for this item range from *$1,717,000* to *$2,033,000*. Although this range is higher than the low cost estimate of *$1,544,000*, the discrepancy in the estimated amount is explained by USACERL's application of Strategy 1 railroad demolition cost estimates to Strategy 2.

Site Infrastructure Costs and Findings

The LRA determined that the total cost estimated for site infrastructure is *$3,003,600*, which is comparatively low when compared with USACERL's cost range of *$5,892,000* to *$6,966,000*. Indicated discrepancies and inconsistencies are individually described below.

Seeding and planting – One of the largest differences in site infrastructure cost estimates is in seeding and planting. As mentioned in the Strategy 1 findings, the LRA determined the cost based on only the hydroseed process, while USACERL determined that a more intensive process including the

borrowing, hauling, and spreading of top soil would be required to accomplish the given site project. The cost of *$320,000* estimated by the LRA appears to be too low given the proposed site improvement as shown by USACERL's range of *$817,000* to *$966,000*.

Utilities demolition – Another large difference between the USACERL and the LRA site infrastructure costs stems from on-site utilities demolition. It is not clear from Strategy 2 why all site utilities would not be demolished when the applicant argues that no system can be used in whole or in part. Coupled with this argument, new trunk line utilities are programmed for the site, which strongly suggests that existing utilities possess no reuse potential. Therefore, USACERL adopted Strategy 1 costs of *$1,327,000* to *$1,568,000* compared with the LRA's Strategy 2 cost of *$906,900*.

Site paving - new roads – Because the LRA failed to provide any information on the new road system for Strategy 2, USACERL relied on its independent assessment of likely costs. Based on the proposed road network presented for Strategy 1 (p 85 of the Reuse Plan) and on the 11 development proposals reviewed by USACERL, it is estimated that these costs will likely range between *$1,329,000* and *$1,573,000*, which is well outside the LRA's estimate of *$608,000*.

It is worth stressing that more descriptive information concerning the proposed capital improvement program in terms of improvement locations and quantities would have greatly assisted USACERL's analysis. This type of standard information, used in parallel with development strategy information such as proposed development costs borne by developers, would generally result in a more coherent and robust analysis.

Building 4 fit-up – DATP consists of various buildings in different conditions. For purposes of determining an estimated value of fit-up costs, USACERL assumed that Building 4 would be reused, which is consistent with Strategy 2 of the DATP Comprehensive Reuse Plan as previously stated. Building 4 is a tall, single story building consisting of approximately 1,107,109 sq ft. The reuse of the space is assumed to be a manufacturing function with a small office component (approximately 3% of gross), which is largely consistent with the goals of the community, private sector, and the City of Warren. Building 4 fit-up costs were generated with an approach that considered three distinct attributes; marketability, damage and deficiency, and Americans with Disabilities Act (ADA) upgrades.

Marketability. One of the base assumptions of the estimate is that the facility will need to be brought up to an acceptable level of condition and performance to

allow it to compete in the local market. Through information gained from various resources, including the Oetzel-Williams Group appraisal, USACERL was able to determine an adequate level of facility condition and performance comparable to similar properties in the area. The major cost associated with marketability is complete replacement of the HVAC system, which is estimated at *$3,497,579*.

Damage and deficiency. Roof replacement and repair and repair of part of the interior concrete floor are the primary costs associated with damage and deficiency. Inspections indicate that approximately 10% of the roofing and insulation need replacement. The roof condition has led to many temporary repairs, and areas have been created that are susceptible to ponding water. A large area of creosote wood block flooring would need to be repaired by replacing it with concrete at an estimated cost of *$184,653*.

ADA. Building 4 is generally a single level facility, which is located on grade. Upgrades to ADA standards would be of minimal cost and are, therefore, considered to be included in the contingency allowance.

USACERL Building 4 Findings

Strategy 2 suggests a Building 4 fit-up cost of $5.00 per sq ft or *$5,535,500*. However, USACERL was unable to determine which actual finishing items were programmed for under this amount.

Alternatively, USACERL developed an independent cost range of *$5,752,705* to *$6,798,850* based on 10- and 30-% contingencies, which includes the following fit-up items and costs:

1. a new HVAC system for the entire building - $3,497,579

2. floor repairs - $164,953

3. replacement of deteriorated roof sections - $1,567,500.

These finishing items are deemed to be appropriate and necessary to bring Building 4 to an "as is" condition under which it can be marketed to the private sector. Additional costs would be incurred if the facility were subdivided into separate spaces for multiple tenants. The HVAC system, fire protection system, and plumbing and electrical service would need to be adjusted to create separate delivery systems for each space.

Conclusions

According to the EDC application and reuse plan, the costs for capital improvements are estimated to range between approximately *$20 million* and *$17 million* for Strategies 1 and 2, respectively. Conversely, USACERL's independent assessments suggest that the estimated costs will range between *$12 million* to *$16 million* under Strategy 1, and from *$16 million* to *$20 million* under Strategy 2. Therefore, the costs presented by the LRA for Strategy 1 are determined to be outside of USACERL's range of cost reasonableness, while Strategy 2 is found to be reasonable. It is worth noting that, with more specific investment strategies and capital cost support provided by the LRA, USACERL's cost estimates would likely change, but to what extent is unknown.

6 Extent of State and Local Investment and Risk

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Background

In Section III.C of the DATP EDC application, the City of Warren LRA contemplates an infrastructure improvement program totaling nearly $19 million for the 147.5-acre EDC parcel known as Strategy 1.* Improvements include the demolition of all existing buildings and most site utilities, in addition to new site utility and road improvements.

Although not contained in the EDC application, Strategy 2 included in the DATP Comprehensive Reuse Plan (City of Warren 1997) outlines an infrastructure improvement program totaling $17.1 million. The key difference from Strategy 1 is the proposed reuse of the 1.1-million-sq-ft Building 4 in addition to Buildings 2, 3, and 4. USACERL developed alternative business plan scenarios (see Chapter 4, **Business Plan Review and Market and Financial Feasibility Analysis**) based on Strategy 2 because of the general resemblance it bears to the development proposals for the EDC parcel submitted to the City of Warren under its RFP process, namely the industrial reuse of Building 4. It should be noted, however, that the EDC application included no supporting business plan analysis for Strategy 2.

* USACERL observed total infrastructure improvement costs referenced within the EDC application varying from $19 million (pp 20-21) to more than $23.5 million (Appendix 7) (in current dollars) for apparently identical improvements.

The DATP LRA will fund $18.8 million of project costs from the sale of developable R&D, industrial, and commercial land (DATP LRA, Application, Appendix 7). Net operational shortfalls of *negative $19.3 million* and *negative $2.5 million* in 1998 and 1999, respectively, will apparently be financed through a mixture of state and local fiscal packaging, though no specific financing mechanisms are included in the business plan pro forma.

Approach

USACERL will discuss the extent of state and local investment risk associated with the redevelopment of DATP, as well as the ability of the City of Warren to implement the reuse plan as proposed in the EDC application. This discussion will be presented through the systematic evaluation of proposed investment, which is required for job creation, and investment risk based on the following evaluation categories: (1) economic, (2) political and organizational, and (3) environmental.

Investment

Infrastructure Improvements

Chapter 5, **Need and Extent of Proposed Infrastructure Improvements**, provides an in-depth discussion of the proposed capital improvements under Strategies 1 and 2.* To summarize, the applicant proposes the following hard costs within the first 5 years of redevelopment (1998-2002) under Strategy 1:

- $11.6 million in building demolition
- $1.3 million in on-site utility demolition
- $2.7 million in new on-site utility and road improvements
- $785,000 in miscellaneous on- and off-site costs.

When project contingencies are added, the proposed capital improvement plan indicates a total cost of over *$20 million* in addition to *$2.75 million* in operating costs. Although USACERL disagrees on some accounts concerning capital

* Strategy 2 serves as the basis for USACERL's developed CERL1, 2, and 3 scenarios contained in Chapter 4 of this technical review.

improvement costs (see Chapter 5, **Need and Extent of Proposed Infrastructure Improvements**), the overall capital improvement strategy, which consists of clearing the site of existing improvements and installing new trunk line systems, appears to be reasonable given the LRA's goals to create jobs and enhance overall site value. Although it could be argued that an untested market for the former tank manufacturing facility exists, overall redevelopment risk could potentially be reduced by the creation of an industrial park that could serve a variety of industries with varying operational requirements. However, the potential benefits associated with this strategy must be tempered by the fact that this level of investment, programmed into the EDC parcel, results in a business plan that is not financially feasible in the absence of fiscal packaging, reduced cost, and/or increased revenues.

Alternatively, Strategy 2 proposes over $17 million in capital improvement investment in the following key areas:

- $2.7 million in demolition (excluding Buildings 1, 2, 3, and 4)
- $906,900 in site utility demolition
- $1.06 million in new on-site utility and road improvements
- $8.1 million in building fit-up for Buildings 1, 2, 3, and 4
- $1.2 million in miscellaneous on- and off-site improvements.

Soft costs of $3.1 million plus the hard costs of $14.0 million listed above result in a total capital investment of *$17.1 million*.

As mentioned earlier, Strategy 2 was not represented in the EDC business plan, although it was detailed in the appendix of the DATP Comprehensive Reuse Plan. As would be expected, overall investment decreases with the reuse of Buildings 1, 2, 3, and 4, which totals nearly $9 million in demolition cost savings. However, demolition cost savings are partially offset by tenant fit-up costs totaling nearly $8.1 million for the four reusable buildings. Again, USACERL disagrees on particular line items associated with Strategy 2 resulting in an overall investment program of *$19.7 million*. Key differences stem from the lack of specificity and support usually found in an EDC capital improvement plan.

From an overall investment strategy viewpoint, Strategy 2 appears to carry more long-term risk in terms of sustained long-term job creation and increasing site value. This risk is fundamentally due to the reuse of Building 4, which the LRA argues in its EDC application has little or no reuse potential in the marketplace. The inability to sell or lease Building 4 poses real problems in

terms of overall site marketing and ongoing operating costs for a building of such size (1.1 million sq ft).*

However, a market for Building 4 has emerged as shown by the robust response from the City of Warren's RFP. Indeed, 11 redevelopment proposals were submitted, with the most serious, as articulated by City officials, being those that propose multitenant reuse of Building 4†. These proposals from reputable companies suggest that a viable market exists and that the City may have to reconsider the demolition of Building 4. Of course, not demolishing the building is not without risk. The City exposes itself to the possibility that some of these companies are using the reuse of Building 4 as a pretext for acceptance into the EDC parcel, one of only 11 Renaissance Zones in the State of Michigan. The reuse of Building 4 could be viewed by the companies as being appealing to the City, which undoubtedly hopes to reduce costs wherever feasible. But, these companies may only reuse the building for a short term in order to reap Renaissance Zone benefits, leaving the City once again with a vacant 1.1-million-sq-ft structure and limited job creation. An expanded discussion of the Renaissance Zone and Warren's RFP follows.

Renaissance Zone

The Renaissance Zone for the DATP site was created by the State of Michigan for a duration of 15 years. Furthermore, each end user in the Zone is eligible to receive a $10 million benefit during the 15 years. As the EDC application notes, "the successful redevelopment of the DATP site is inextricably connected to the preservation of the Renaissance Zone." Indeed, the tax benefits derived from a Renaissance Zone are attractive and substantial as shown by the following taxes waived by State of Michigan Renaissance Zone law:

- Michigan Single Business Tax
- Michigan Personal Income Tax
- Michigan 6 Mill State Education Tax

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* Figure 3 provides the general site plan for DATP. As can be clearly seen from the diagram, Building 4 divides the site, in effect, restricting overall site cohesion and internal circulation.

† USACERL contacted the City of Warren's Assistant City Attorney Ed Servitto on 1 August 1997 to discuss the strengths and weaknesses of the 11 development proposals. In an effort to reduce the number of proposals to review, USACERL requested that Mr. Servitto suggest which proposals were under the most serious consideration by the City. Mr. Servitto indicated that the City was most interested in the redevelopment proposals submitted by Kojaian/DCT/Signature, Ashley Capital, and HSA READ, all of which proposed a multitenant reuse for Building 4.

- Local Personal Property Tax
- Local Real Property Tax
- Local Income Tax
- Utility Users Tax.

A key component of the Renaissance Zone legislation is the requirement that school districts within a Zone be reimbursed by the State for tax revenue lost as a result of the designation. According to the City of Warren, the State is estimated to reimburse local school districts nearly $20.5 million. Similarly, the City of Warren will forego nearly $8.5 million in local taxes under Renaissance Zone designation. An alternative way to view these lost revenues is as an additional investment in DATP of nearly $30 million by the State and the City of Warren to promote job creation, rapid redevelopment, and quality end users through the increased marketability of the site. In effect, total investment could be viewed as potentially being nearly $50 million ($19 million in capital improvements plus $30 million in foregone fiscal revenue).

Request for Proposals

A unique feature of the DATP EDC is the market-driven process by which the LRA will secure end users and create jobs. The City of Warren executed an aggressive marketing campaign totaling over $300,000, including several redevelopment RFP solicitations in the *Wall Street Journal* (Attachment 5, City of Warren EDC Application). The RFP resulted in the submission of 11 redevelopment proposals for all or part of the EDC parcel and the potential creation of 3,000 to 6,000 on-site jobs.

Consistent with the goals and objectives of the DATP Comprehensive Reuse Plan (see Chapter 3, **EDC Application's Consistency with the Overall Redevelopment Plan**), most redevelopment strategies proposed industrial, research and development, and limited office uses. In addition, many proposals indicated a multitenant reuse for Building 4 (mentioned elsewhere in this report).

However, what was not presented in the proposals was a clear definition of the public and private roles relative to redevelopment of DATP. Although requirements for site infrastructure, demolition, and building fit-up were discussed in varying detail, a discussion of the responsibility for executing those improvements was absent. Of particular concern to USACERL, the Office of the Secretary of Defense, and Army decision makers is the level of investment the LRA will actually make into the EDC parcel in light of the robust RFP response. At the time of this review, it was unclear to USACERL if the City of Warren's

business plan strategy would be modified through either an increase or decrease in investment in response to the potential development deals proposed through the RFP. The extent of public investment, in light of the development proposals, will become a subject during negotiations to determine if a discount from property fair market value may be justified under the EDC implementing regulations.*

Risk

Economic Risk

The two components of economic risk are financial and market risk. Financial risk, defined as the likelihood that the LRA will be able to meet its financial obligations from projected revenue sources, appears to be moderate given that the Detroit commercial real estate market is rebounding from the recessionary downturn of the late 1980s and early 1990s. This rebound translates into demand for industrial and R&D space, especially space located on prime transportation corridors as DATP is. Strong market conditions, the City's proposed level of investment (as contained in the EDC application), and the demand-generating Renaissance Zone designation, greatly increase the probability that the City of Warren will achieve market sales rates for industrial and R&D land. Based on market land prices, Warren has projected over $18 million in real estate revenues over 7 years to offset land improvement and operating costs of nearly $23 million. Finally, while USACERL and BAE cannot make any strong predictions on market conditions and demand for DATP land, the short-term investment horizon as set out by the LRA does allow for a lower degree of uncertainty.

However, USACERL and BAE determined that capital improvement subsidies of at least $5 million could be secured and applied toward infrastructure investment. Under the State of Michigan's Renaissance Fund program, up to $5 million in grant assistance may be applied to the redevelopment of DATP because of the job creation focus. Moreover, infrastructure grants are available from the Department of Commerce's EDA for BRAC properties. It is the belief of USACERL and BAE that the City of Warren will seek these and other grants as evidenced by the extensive discussion of fiscal packaging contained in the

* See 32 CFR Section 91.7(f)(2)(ii).

Comprehensive Reuse Plan (pp 109-113). Grant revenues will most likely reduce operational shortfalls resulting in a financially feasible business plan, thus reducing Warren's overall economic risk exposure (see Chapter 4, **Business Plan Review and Market and Financial Feasibility Analysis**).

Political and Organizational Risk

Political and organizational risk is defined simply as the degree of risk associated with LRA and Federal government political actions which serve to support or undermine redevelopment, and the organizational competence of the LRA to implement the Reuse Plan from a nonfinancial viewpoint. As affected by government actions and those of the City of Warren, the overall level of risk associated with the redevelopment of DATP is perceived to be moderate to moderately high. The two main reasons for this conclusion are: (1) the City of Warren has rejected all 11 redevelopment proposals, and (2) if the Department of the Army cannot deed a portion of the EDC parcel to the City of Warren by 31 December 1997, Renaissance Zone status will expire.

On the first count, the rejection of all 11 proposals can send a negative signal to the market place in terms of Warren's desire to redevelop the 147.5-acre site. Conversations with Assistant City Attorney Servitto have suggested that the proposals were too speculative from a real estate standpoint and did not clearly specify job generation levels. Coupled with this observation, Mr. Servitto reflected concern that environmental cleanup of contaminated parcels by the Department of the Army would not occur rapidly enough, which would cause some companies to withdraw interest. At the time of this review, it was unclear to USACERL and BAE, due to a lack of available information, on how environmental cleanup schedules would impact the proposed phasing of the reuse plan (see ***Environmental Risk***).

In terms of Warren's ability to qualify for the remaining 14 years of the State of Michigan granted 15-yr Renaissance Zone designation, the City must hold deed to all or part of the 147.5-acre EDC parcel by 31 December 1997. Recall that one of the key demand generators for the site is the Renaissance Zone itself, which entitles companies locating within the site 14 years of substantial tax benefits. If the Department of the Army were unable to transfer a deed or deed in escrow by 31 December 1997, for any reason, the State of Michigan would withdraw the designation. Without the Renaissance Zone to attract developer and investor interest, property absorption timelines and pricing strategies could be compromised, thus jeopardizing job creation and financial feasibility. It is clear that the Renaissance Zone is contributing to the overall marketability and potential job creation of the site as evidenced by the 11 development proposals,

but it is difficult for USACERL and BAE to determine the extent. Therefore, it is important for the City of Warren and the Department of the Army to work toward the common goal of conveying the property as soon as practical, and certainly no later than 31 December 1997.

Environmental Risk

Because of the lack of information to suggest a rapid site cleanup, the potential for risk in this category appears to be relatively high. Based on key interviews with Army personnel, a finding of suitability to transfer (FOST) will, in all likelihood, be granted for at least 22 acres by December 1997. This first property transfer would apparently satisfy the State of Michigan in terms of the continuance of the Renaissance Zone. As such, the real environmental risk is not necessarily associated with the first FOST, but is based on the ability of the Army to rapidly transfer remaining parcels that satisfy prescribed cleanup criteria. The Army has indicated that a strenuous effort will be made to transfer all property by April 1999. Based on past experience, however, USACERL believes that environmental remediation timelines are often prone to unforeseen contingencies and, as such, should be appropriately considered during negotiations. USACERL developed an alternative financial feasibility scenario around the possibility of environmental encumbrances in Chapter 4, **Business Plan Review and Market and Financial Feasibility Analysis**.

A fragmented or piecemeal approach to cleanup could jeopardize master planning and phasing efforts that seek to develop larger parcels at one time. This type of risk translates into uncertain projected cash flows which potentially reduce overall financial feasibility of the project. Moreover, ongoing site environmental encumbrances tend to induce a "chilling effect" on lenders and developers alike because of perceived liabilities.

Conclusion

USACERL concludes that the LRA's level of investment, as proposed, is adequate and appropriate to stimulate job creation. As noted, however, the capital improvement plan suffers from several deficiencies and may be subject to change based on the robust market response for the EDC property. Therefore, investment issues in terms of public and private contribution to redevelopment must be appropriately reconciled during negotiations.

In terms of risk, while the risks associated with the redevelopment of DATP are typical of any real estate development of this magnitude, risk exposure is

reduced to some degree by the Renaissance Zone designation. However, some of the potential risk-reducing effects of the Renaissance Zone could be partially offset by LRA management and environmental risk.

7 Local and Regional Real Estate Market Conditions

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Methodology

Local and regional residential, office, and industrial real estate market data were gathered and compared to real estate market information given in the DATP EDC application and reuse plan. Real estate market data were collected from a variety of sources including real estate research firms, Urban Land Institute "Market Profiles," government studies conducted in conjunction with BRAC initiatives, the Corps of Engineers' Appraisal and Market Analysis, and various other market sources. Independently gathered data were used, in part, to confirm or dispute claims made in the EDC application and reuse plan relating to real estate conditions, impacts due to base closure, and economic redevelopment anticipated from an EDC.

Background

As part of the process of evaluating the Detroit-area market, USACERL examined the area surrounding the EDC parcel, the locations and characteristics of the regional submarket relevant to DATP, and recent regional economic and demographic trends.

Site Configuration

The entire Detroit Arsenal facility covers about 342 acres in the City of Warren, MI, in Macomb County, and lies about 3 miles north of Detroit and Wayne County. The tank plant portion of the facility (DATP) has a footprint of about

147 acres, including 53 structures and facilities, or about 1,453,000 gross sq ft.* Since the mission of DATP has been relocated to other bases, the entire tank production facility is available for reuse.† As of 1 October 1997, all realignment activities are scheduled for completion by 30 December 1997.

The Detroit Arsenal is on the western edge of Van Dyke Avenue (also listed as State Highway 53), about one-quarter mile north of Interstate 696, and also fronts 11 Mile Road (which runs east/west). The DATP portion of the arsenal occupies the eastern side of the facility between a Conrail railroad line and Van Dyke Avenue. Because of this location, the DATP site has particularly good transportation access. Besides the direct access to I-696, the site also has three curb cuts onto Van Dyke Avenue, which is a five-lane arterial, and direct rail access to the Conrail line. According to City of Warren transportation officials, there are no plans to increase the size of Van Dyke Avenue, although there are plans to improve its surface condition over the next 6 years.

The immediate area surrounding the DATP site is characterized by industrial and manufacturing land uses, with some supporting retail nearby and supporting residential in nearby cities. Adjacent uses include the Detroit Arsenal, a General Motors R&D laboratory, headquarters for Volkswagen USA, and several tracts of single-family housing.

Regional Submarkets

DATP is in Macomb County, which is a submarket of the metropolitan Detroit industrial real estate market. For purposes of compatibility with the DEA, the appraisal developed by the Corps of Engineers, and other portions of this report, this market analysis focuses primarily on a three-county area within metropolitan Detroit that includes Macomb, Wayne, and Oakland counties. Figure 1 shows the geographical relationship between DATP and the Greater Detroit urban area (including the tri-county submarket) and major transportation corridors. As the figure indicates, the submarket that includes DATP is in the heart of the metropolitan Detroit area.

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* See DEA, p 2-1

† Note that the EDC application consistently refers to a maximum reusable acreage of about 153 acres. While this inconsistency is not discussed in the EDC application, it appears that the EDC application assumes that Buildings 7 and 8 will eventually be turned over to the LRA for redevelopment. At this time, however, USACERL is unaware of any plans by the Army to make these facilities available.

Other regional submarket areas exist along the I-75 corridor in the Auburn Hills area, which is part of the Southeast Oakland County submarket, and along M-14 in Plymouth township, which is part of the Western Wayne County submarket. Note that other regional submarkets in the area are typically less focused on manufacturing and industrial land uses in favor of more diversified land uses.

Regional Economic and Demographic Trends

Given that the city of Warren is within metropolitan Detroit, it is not surprising that the primary driving force for the Detroit area economy is the automotive industry and manufacturing in general. For example, the headquarters for Chrysler, General Motors, and Ford are all within Greater Detroit. These firms are also the three largest employers in the area. Other significant area economic forces center on automotive suppliers and tool and die production.

This dependence on manufacturing industries has been decreasing in the area over the last decade, however. For example, as automotive industry practices have evolved to accommodate advances such as just-in-time manufacturing, supplier-based R&D, and relocation of management services, Detroit has also diversified its economic base to include more nonmanufacturing and service industries. Detroit-area cities have also increasingly favored the development of "high-tech" industries. Despite these trends, Macomb County and the City of Warren remain committed to "strengthening the existing base of manufacturing and tool & die sectors."*

Although the 1980-81 recession and the more recent "economic slowdown" of the early 1990s caused employment levels for manufacturing industries in the area to decline, employment in service-producing and other nonmanufacturing industries has been increasing through 1996. These economic factors have also further encouraged the diversification of area manufacturing concerns. This trend is shown by the fact that total employment for the tri-county area increased some 9% from 1990 to 1996. This contrasts with the employment gains for the entire Detroit Metropolitan Statistical Area, which amounted to about 8% for the same period. Macomb County, which contains the DATP facility, hit a recent low in unemployment with a rate of 3.5% (as of October 1996).

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* See Reuse Plan, p 10.

Demographic trends in the area also suggest continued moderate and stable growth in the area. Annual population growth in the tri-county region has been on the rebound since the exodus that occurred during the 1980s, in which the area (particularly in Wayne County) lost some 3.2% of its total population. From 1990 to 1995, area population increased by just under 1%, and it is projected to increase by 1 to 1.5% for each 5-yr period through 2005.

Market Analysis

After a general analysis of the DATP area regional submarket, USACERL proceeded to examine the state of the commercial real estate market in the area. Since reuse of the DATP facility will center on manufacturing and industrial uses, particular emphasis was placed on this local market segment. Finally, although this market analysis focused only on the tri-county area around DATP, it is important to realize that many relevant market factors and conditions exist far outside this area. In particular, the size and range of potential uses for the DATP facility essentially mandate that it compete on a national or super-regional market. Thus, unlike the situation with smaller or more specialized properties, the value of the DATP facility will likely be tied directly to competitive pressures that exist in other states.

Current State of the Industrial Market

In general, the industrial market conditions for the greater Detroit area have completely or almost completely recovered from the 1980's-era recessionary doldrums. During 1991 to 1996, available industrial space in the tri-county area decreased by 44% and by 32% in Macomb County alone.* In more absolute numbers, available space in the 500-million-sq-ft market decreased from about 39 million sq ft in 1991 to just over 22 million sq ft in early 1997, with total yearly absorption averaging about 17 million sq ft. The availability of manufacturing space, in particular, dropped by 49% over this period, while available high-tech space dropped by about 38%.

Available data also suggest that the leasing rates for all industrial properties across the tri-county area have been holding roughly steady, or increasing, since 1991. Lease rate data, in particular, suggest that rates for high-tech space have

* Appraisal, p 74.

increased by some 9 to 12% in area submarkets, while sales prices have increased from 18 to 33% over the 1991 to 1996 period.

Along with this trend, sale prices for manufacturing buildings have increased by about 15% over this period. Sales prices for high-tech uses, however, have dropped by about 4% for the period. One explanation for this anomaly is that high-tech firms are particularly sensitive to geographic placement and seem to prefer to locate in other regional submarkets with established high-tech centers.*

Vacancy rates for this timeframe also support the image of a recovering market. According to Cushman & Wakefield market inventory reports, the total market inventory in 1990 amounted to about 400 million sq ft of space, which carried an 8.3% vacancy rate. At the end of the first quarter of 1997, however, total market inventory had increased to about 500 million sq ft, with a vacancy rate of only about 4.5%. More simply, the vacancy rate for this area has dropped by about 45% during the last 6 years while more than 100 million sq ft of inventory has been added to the market. County-level figures estimate that the overall vacancy rate for Macomb County is even lower than that for the tri-county area as a whole, with a current rate of about 3.7%.

Net absorption figures indicate that roughly 17.7 million sq ft of space has been leased or sold each year for the last 6 years. However, note that current inventory levels of about 22.7 million sq ft indicate that at least a 1.3- to 1.5-yr supply of space is still available, and that the DATP facility itself will offer potentially at least 1.1 million sq ft of space. Within the Macomb County submarket, the entire DATP could easily represent between 6 and 33% of all potential annual absorption for the county.

Note also that much of this absorption activity represents movement from one Detroit area to another, rather than use by new businesses moving into the area. Thus, the time required to absorb vacant space in the tri-county area will likely be longer than these absolute figures would seem to indicate.

The market for vacant industrial land has also improved over the last 6 years, although current Cushman & Wakefield estimates indicate that Southern

* More specifically, it appears that employees of high-tech firms (who are highly paid and better able to demand concessions) are more willing to work for employers who are geographically close to suburban areas or areas with an array of amenities. Thus, while the firm may not be directly more sensitive to location, its employees might be.

Michigan still has a 6- to 12-yr supply available. Time-series studies of raw land supplies in the Detroit area are somewhat unreliable in that wavering demand can cause municipalities to facilitate the development of utilities and other infrastructure improvements necessary to develop formerly agricultural land into industrial facilities. Thus, data from year to year may not be directly comparable because the available supply will be increasing annually. Nevertheless, a study conducted by Trerice-Tosto indicates that annual absorption of raw land within the City of Warren has averaged about 14 acres per year since 1990, which represents an average of only about 2.5% of available inventories. Thus, the DATP facility (if vacant) could roughly represent an 11-yr supply (using these average absorption rates). However, qualitative aspects of the local Warren market could also affect these rates, particularly if the DATP facility could be developed as one large parcel. Other available parcels have been much smaller.

Industrial Leasing and Sales Rates

Analysis of lease rates from market comparables also supports the contention that continued high demand for industrial space, combined with a lack of available quality space, will continue to strengthen the local market. However, generation of relevant lease rate data for the DATP site was complicated by both the uniqueness of the DATP site, and the relatively slow-moving nature of transactions that involve such a large facility. Because of these qualitative differences between DATP and many of the available market comparables, USACERL found that it would not be appropriate to base sales value predictions on them, although a rough estimate of lease values has been provided. Thus, the value of these comparables lies more in providing an idea of what is currently occurring in the local market.

In general, available comparables indicate that rental rates for industrial/office uses are ranging from $4.25/sq ft to almost $7.00/sq ft (all prices are triple-net [NNN]), with higher rates relating directly to the usefulness of a facility for office or high-tech purposes. Within this group of comparables, most of the rates for the Warren area were toward the lower end of this range, or from $4.00 to about $6.00/sq ft, while the higher ranges were typically observed in neighboring submarkets. Also, note that the zoning on many of these facilities was M-1, instead of the M-3/PUD designation to be held by the DATP facility (which further limits their direct application). Additionally, many of these facilities are somewhat newer than the DATP facility, and may be able to command a slight market premium because of less functional obsolescence.

With these caveats in mind, it is USACERL's conclusion that a "typical" market rental rate of about $3.50/sq ft (NNN) is probably a reasonable estimate of what the DATP property might be likely to achieve in the local market. Although higher rates may be observed later in the redevelopment cycle, currently available data suggest that this estimate is appropriate for the bulk of earlier leasing. Note that this would include Building 4 under USACERL's preferred reuse scenario, since this scenario anticipates its near-immediate reuse.

Sales rates for this group of comparables ranged from about $11.00 to $22.00 per usable square foot of building space, although rates in the $12.00 to $14.00 range probably better represent a "typical" sale. As noted, the lack of consistent comparable data renders these estimates too speculative to offer a conclusion that is directly applicable to the DATP facility.

Available comparable data for industrial sales indicate that prices for raw industrial land in the Greater Detroit area have increased recently, with sales trending toward a price of around $130,000 per acre, or just under $3.00/sq ft. However, many of these sales have occurred outside the local market containing the DATP facility and may not be directly comparable. Additionally, all of these comparable properties differ from the DATP site both in size and zoning. Thus, these averages may not be significantly predictive of possible sales values for the DATP facility.

Economic Development Conditions

As a final consideration, USACERL also considered what sort of market impact might occur if the LRA attains its goal of receiving a Renaissance Zone designation status for the redeveloped DATP facility. Although this analysis was not grounded in enough specific facts to offer a firm estimate of the dollar value of this status, USACERL was able to offer some qualitative assessments.

The Renaissance Zone status will ostensibly be a strong demand generator for the DATP facility, since, by law, the Renaissance Zone designation waives a series of common business taxes, including:*

* Note that businesses would still pay Federal taxes or fees for service such as unemployment insurance, Social Security taxes, workers' compensation, and sewer and water fees. Businesses would also pay property taxes that result from local bonded indebtedness or special assessments so as not to jeopardize the current bonds of the City of Warren. Finally, businesses would also pay Michigan's 6% sales tax (Michigan does not allow local sales taxes).

- Michigan Single Business Tax
- Michigan Personal Income Tax
- Michigan's 6 Mill State Education Tax
- Local Personal Property Tax
- Local Real Property Tax
- Local Income Tax
- Utility Users Tax

Under the terms of the Renaissance Zone legislation, the Renaissance Zone designation can run for up to 15 years, which is the projected life of the program for the DATP facility (other communities have received 10-yr periods or less). In all cases, the benefits of the status will engage on 1 January 1998, and will run regardless of what businesses are in the area. Thus, if a business locates at DATP in the year 2001, it will have 12 years of tax-free status remaining. Note that the final 3 years of the zone will begin a phase-in of taxation. For example, in year 13, businesses will pay 25% of the applicable taxes, 50% in year 14, 75% in year 15, and 100% the following year and every year thereafter.

Because a variety of details about future users of the DATP facility are currently unavailable, and the economic benefits of the Renaissance Zone status depend heavily on the specific activities of each particular business, USACERL was unable to calculate precisely how much a business might save by moving to the DATP facility. Nevertheless, it is quite clear that the potential benefits to a tenant would be significant, particularly for a manufacturing user with a large number of employees, or a user that dramatically increases the value of property within the Renaissance Zone. The benefits to a warehouse or distribution user (or any other use that is less intense) would likely not be as significant (although the future zoning of the property will probably not permit these uses anyway).

Assuming that this status is granted for the DATP property, USACERL is confident that it will provide an incentive for businesses to relocate to DATP. However, it is not clear how strong this incentive may be. Since the state has authorized the creation of at least 11 of these zones, and since a zone can be up to 5,000 acres in size (or 0.004% of a locality's total acreage), it appears likely that the redeveloped DATP facility will have to compete with nearby cities for potential Zone businesses. Furthermore, several of the other zones that have already been approved are much larger, and may be of more interest to the sort

of large-scale industrial or manufacturing users that Warren is seeking.* At the very least, the comparative returns to scale that might be realized by a relocating business would seem to suggest that such a status would be of most interest to larger users.† Therefore, it appears at least possible that the DATP site may become a second-among-equals in the local Renaissance Zone group.

Additionally, Zone legislation does not have any significant mechanisms to discourage existing businesses in the local area to relocate. Rather, it appears quite possible that potential DATP tenants may simply move in from another nearby city. While this will obviously not benefit the other city, it may not prove to be much of a benefit to Warren either, because many of the economic linkages of the business would probably remain tied to the businesses' original location.‡ Thus, Warren may end up simply cannibalizing the tax base of other nearby cities, without much of a compensating return.

Finally, it should be noted that the LRA has also stated that it intends to require potential users of the DATP facility to comply with the terms of a fairly specific development agreement. Although USACERL is not qualified to render a legal opinion on this matter, it appears likely that the highly specific nature of the agreement, and the associated penalties, may discourage some potential tenants from selecting DATP. For example, the agreement mandates that a business provide a verifiable minimum number of jobs to the City of Warren, or to pay penalties of up to $20,000 per job that is not provided directly to the City. Although the conditions under which this penalty would be assessable would typically be unlikely to occur,§ it is USACERL's opinion that their very possibility may somewhat limit the desirability of the property. The agreement also has

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* More specifically, the City of Detroit has a Zone of 1,345 acres, the former Wurtsmith Air Force Base has a Zone of over 2,200 acres, Flint has a Zone of 836 acres, and several other counties have Zones from several hundred acres to almost 3,000 acres. The DATP facility is about 150 acres in size.

† Recall that returns to scale exist for most manufacturing or industrial activities. Because the tax benefits of the Zone designation are tied to total revenue, these benefits will also map directly to any available scale returns. Thus, the proportionate tax benefit will probably be larger for larger uses (all else being equal). It is interesting to note that the State of Michigan apparently also sees the Renaissance Zone legislation as something likely to be of interest mainly to very large scale users—it is marketing the program throughout the 50 states to large companies through publications like the *Wall Street Journal*, rather than attempting to lure smaller "mom-and-pop" operations.

‡ More simply, it is possible that a business may simply move its physical location without really moving its economic connections. For example, a small manufacturing center may continue to source raw materials and labor from outside the local area, and have employees that live outside the local area. While such an arrangement would have some economic benefit to the City of Warren, the net benefit would be much smaller than would be the case for a business moving in from outside the state.

§ For most businesses, the terms of the agreement would actually require only a fraction of the number of jobs that the business would likely provide anyway, at least under full-employment (i.e., nonrecessionary) conditions.

other similarly unfavorable terms. Although USACERL was unable to accurately quantify these effects, it does appear likely that they may offset at least some of the potential marketing benefits offered by the Renaissance Zone status.

8 Army Disposal Plan, Other Federal Agency Concerns, and Other Property Disposal Authorities

As part of the EDC application review process adopted by the BRAC office at HQUSACE and presented at the Corps of Engineers Real Estate Workshop in Denver, CO, in December 1995, USACERL has been asked to defer comment on these issues to the Real Estate Directorate at HQUSACE and the Corps of Engineers District, Louisville. In addition, both the negotiation process leading up to the submittal of the formal EDC application and review of the legal environment related to real and personal property disposal are beyond the scope of USACERL's technical review.

Future EDC reviews will continue to explore these issues insofar as they pertain to other elements of the technical review. Summaries of USACERL's findings on these matters will be documented when appropriate and when requested by Army decision makers.

9 Economic Benefit to the Federal Government

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Introduction

One of the criteria for EDC applicant eligibility that may be considered by the military department is the economic benefit to the Federal Government that will be derived from the proposed EDC. The military department is asked to consider the protection and maintenance cost savings that would be avoided by a swift conveyance of the EDC parcel, as well as the anticipated consideration from the transfer. In the EDC application at DATP, the City of Warren has requested the EDC parcel for no cost. In addition, the applicant argues that, by rapidly assuming responsibility for the DATP property, the Army may realize substantial operations and maintenance cost savings. In an attempt to independently evaluate these claims, USACERL calculated the one-time layaway costs and annual maintenance and repair (M&R) costs associated with "mothballing" the facilities in the absence of an EDC. Also discussed here is the potential consideration for the property that could be defended in a negotiated arrangement.

Conclusions

Layaway and Annual M&R Cost Savings

Without a timely conveyance of the 147.5-acre EDC parcel after all Army uses for the property cease, USACERL assumed that the Army would be compelled to mothball or "lay away" the facilities and infrastructure at DATP except for those uses being retained by the Federal Government (i.e., Army Caretaker Force, BRAC environmental cleanup team, and TACOM mission in Buildings 7 and 8).

In addition, USACERL assumed that M&R costs would be incurred to operate the existing utilities that support those Federal tenants. USACERL estimated the cost of this layaway program using guidance spelled out in the U.S. Army Center for Public Works (USACPW) Technical Note 420-10-08 and USACERL Technical Report (TR) M-91/23, *Layaway Procedures for Facilities, Volume II: Inspection and Maintenance Repair Checklists.* The cost estimating procedures were supplemented with information USACERL gained from conversations with several DATP facilities engineers and with the experience of USACERL researchers.

USACERL estimated the layaway and annual M&R costs for the buildings and supporting infrastructure at DATP based on three levels of layaway: Levels 1, 2, and 3. Each layaway level corresponds to a decreasing level of care. For example, Layaway Level 1 would be used when the intent is to revive the facility at a later time with as little effort as possible (i.e., to support reuse by an LRA); whereas Level 3 assumes the building will be more or less abandoned (i.e., an approved reuse plan contemplates demolition, or no reuse for the property is obvious). Tables 9.1 and 9.2 provide a range of values for the cost of one-time layaway followed by annual M&R for each of the described layaway levels. An expanded discussion of these one-time layaway costs and annual M&R costs follows.

Table 9.1. One-time layaway cost estimates for DATP.

One-time Layaway Costs					
Layaway Level Three		Layaway Level Two		Layaway Level One	
Total min	Total high	Total min	Total high	Total min	Total high
$132,211	$264,422	$347,053	$607,344	$240,754	$481,509

Table 9.2. Annual M&R cost estimates for DATP.

Annual Maintenance and Repair Costs					
M&R Level Three		M&R Level Two		M&R Level One	
Total min	Total high	Total min	Total high	Total min	Total high
$116,642	$233,284	$384,918	$673,607	$664,961	$1,196,930

Layaway Level One. In this layaway level, buildings are laid away, secured, frequently inspected, repaired, and have most utilities active. The intent of this level of layaway is to reactivate the facility at a later date with as little effort as possible. Buildings are heated at 55 °F in the winter and cooled to 80 °F in the summer.

Annual M&R in the years following the one-time layaway would include a security force patrolling the area, a small interdisciplinary workforce to inspect the infrastructure systems frequently and make necessary repairs, and a regular landscape and maintenance schedule.

Layaway Level Two. In this layaway level, buildings are laid away, secured, frequently inspected, repaired, and have most utilities shut off. The intent of this level of layaway is to have the facility available for future use. Utilities will be maintained on an "as needed" basis by the security force, inspectors, and caretaker force.

Annual M&R in the years following the one-time layaway would include a security force patrolling the area, a small interdisciplinary caretaker force that would inspect the infrastructure systems annually and make minor repairs, and a regular landscape maintenance schedule.

Layaway Level Three. This layaway level is called the "do nothing" level as outlined in USACERL TR M91/23, *Layaway Procedures for U.S. Army Facilities, Volume 1: Decision Criteria and Economics.* Simply put, the installation personnel will "lock the door as they leave the building," abandon the facility, and do no maintenance on the infrastructure. Buildings will have the personal items removed, be cleaned (swept/mopped), and be secured. Utilities will be abandoned or cut in place.

Level Three annual M&R is minimal. However, security for the installation will still be required, with some facilities to house the security force. Minor landscape maintenance will be required also.

Probable Layaway and M&R Program in the Absence of an EDC

TACOM reports that current operating costs for DATP approach $4 million. After General Dynamics completely vacates the premises in late 1997, this cost is likely to fall. If the EDC is not approved in December 1997, and the Army is forced to continue its caretaker function at DATP, it is likely that the Army would be required to maintain the property so as to allow for parcelization and redevelopment of the base in accordance with the Comprehensive Reuse Plan for DATP. Therefore, the probable layaway and M&R program for the EDC parcel would likely include layaway and M&R consistent with the requirements of Level 1 to ensure rapid property transfer through willing buyers. Table 9.3 provides a range of costs for this scenario.

Table 9.3. Likely Army layaway and M&R commitments.

	Layaway Level One	
	Total min	Total high
For EDC parcel and Federal uses	$240,754	$481,509
	M&R Level One	
	Total min	Total high
For EDC parcel and Federal uses	$664,961	$1,196,930
Total	$905,715	$1,678,439

Based on these projected costs and the costs discussed in Table 9.3, the Army could expect to incur at least $664,961 in annual carrying costs for DATP in the absence of an EDC. Since the City of Warren is prepared to assume responsibility for DATP by 31 December 1997, which is the Federally mandated closure date, the Army should consider an O&M cost avoidance to the extent that a successful conveyance cannot be achieved by that date.

Anticipated Consideration From the Conveyance

Summary of LRA Proposal

The LRA application proposes no monetary consideration to the Army for the 147.5-acre EDC parcel and supporting water, sewer, drainage, gas, electric, communications, and internal roadway systems. The applicant argues the following:

- the appraised value of the site is negative, so requesting the site at no cost is consistent with the fair market value of the site
- the level of investment required by the City of Warren to establish a positive cash flow
- the substantial indirect monetary benefits the Army will receive as a result of the expedited transfer of the DATP to the City of Warren.

USACERL Findings

USACERL provided extensive discussion in Chapter 4, **Business Plan Review and Market and Financial Feasibility Analysis**, regarding the analysis of the applicant's business plan and the NPV of the business plan. In summary, USACERL concluded that the applicant failed to adequately support their finding of business plan value (also considered the ability of the applicant to pay

the Army). When USACERL recasted the business plan using available supporting market studies, appraisal reports, and other documents, the NPV of the business plan ranged from *negative $7.1 million* to *negative $6.5 million* in comparison to the LRA's indicated value of *negative $10.2 million*. However, USACERL was able to independently support a range of project NPVs for the business plan of *positive $1.3 million* to *positive $5.1 million* when grant funding is applied to capital costs. Thus, the LRA's claim that the business plan has an indicated negative value is weakly supported as shown by USACERL's finding of financial feasibility.

Level of investment. The City of Warren has proposed to underwrite a majority of the costs associated with the redevelopment of DATP, including $2.7 million in operating expenditures and $17.1 million to $20.2 million in capital improvements. These costs are to be offset with real estate revenues, grants, and development bonds. Investment is further enhanced when Renaissance Zone benefits are considered. The State of Michigan has designated the DATP site one of 11 Renaissance Zones in the state. Simply put, a Renaissance Zone entitles private sector investors significant tax advantage for up to 15 years on the condition that well-paying jobs are created. The LRA estimates that total tax advantages could be as much as $30 million over 15 years, depending on the quality and timing of development. These tax benefits could also be interpreted as investment by the state and the City of Warren to increase the potential for success at DATP.

It is worth noting, however, that Warren's direct investment into site capital improvements is unclear in light of the 11 development proposals received as a result of the City's RFP process. Indeed, a strong response suggests willing buyers for all or part of the site. However, Warren's level of investment could change in response to the levels of investment proposed by the bidders. This issue should be addressed during negotiations to ensure that an EDC is an appropriate transfer mechanism for the DATP site. In USACERL's opinion, if proposed investment levels remain unchanged, an EDC is justified because, in the absence of an EDC, the City of Warren would not be able to achieve its stated job creation goals.

Recommendation

Based on the eligibility factors/criteria reviewed for this report, it is the opinion of USACERL that the applicant is eligible for an EDC so long as proposed capital investments do not decrease as a result of developer and investor interest in the EDC parcel. However, USACERL cannot find support for a

discounted conveyance based on the economic impact from the closure and potential for recovery (see Chapter 1). The Army's final determination of value and possible consideration must rest largely on the results of a negotiation process between the Army and the EDA and the Army's fair market value appraisal results. If a discount is deemed appropriate based upon other review factors, the Army should consider probable layaway and O&M costs savings of nearly $1.7 million, or the LRA's proposed level of capital investment.

10 Review of Application for Completeness

This chapter summarizes USACERL's review of the City of Warren's EDC for completeness as required by 32 CFR Part 91.7(e)(5). The contents of the requirements are listed below in italics, followed by USACERL's findings.

1. *Copy of the adopted Reuse Plan.* A copy of the plan is included.

2. *Project narrative*, including:

   a. *General description of the property requested.* A description is provided but does not appropriately address the Army's intention to retain Buildings 7 and 8.

   b. *Description of intended uses.* A description is provided. However, the reuse plan is fraught with considerable uncertainty relative to land use ratios and building reuse. In part, this uncertainty stems from the inherent flexibility of the document, but in USACERL's opinion is more related to the City of Warren's RFP process, which was intended to reflect the optimal reuse of the EDC parcel. From a planning perspective, this process is certainly reasonable but, from the Army's perspective, this complicates technical review requirements and property negotiations.

   c. *Description of the economic impact of the closure on local communities.* A minimally acceptable description is provided, although gaps in relevant source data concerning the fiscal outlay of the DATP facility during the year of closure complicated USACERL's technical review.

   d. *Description of the financial condition of the community.* The current financial condition of Warren was not explicitly described in any referenced documentation. However, a discussion of Renaissance Zone impacts on development, the City of Warren, and the State of Michigan was included.

   e. *Statement of how the EDC is consistent with the overall Reuse Plan.* The application provides a short discussion of consistency with the adopted Reuse Plan.

3. *Description of how the EDC will contribute to short- and long-term job creation and economic redevelopment.* A short discussion is provided but was limited in that its conclusions were unsupported by referenced material or source data.

4. *Business and development plan for the EDC parcel*, including:

   a. *Development plan, timetable, phasing plan, and cash flow analysis.*

   b. *Market and financial feasibility analysis*

   c. *Cost estimate or justification for infrastructure and other investments needed for development of the EDC parcel*

   d. *Local investment and proposed financing strategies for the development.*

Element 4(a) was included as was deemed to be satisfactory. Element 4(b) was included, but failed to present a financially feasible business plan. In light of strong market interest in the DATP site and access to grant funding, it is USACERL's belief that the City of Warren is capable of developing a financially feasible business plan. Element 4(c) was included, but was found to be generally unsatisfactory by USACERL. Proposed capital improvements were found to be vague and generally lacking the detail usually observed with other EDC applications. USACERL's review was further complicated by the fact that proposed capital improvements could change in light of strong market demand for the EDC parcel. Finally, review element 4(d) was included, but failed to provide any financing strategies to cover operational shortfalls. USACERL's independent analysis demonstrates that the business plan is financially feasible based on access to grant funding and projected real estate revenues. However, the Army must be cautious of the LRA's level of investment, which could be reduced as a result of strong market interest.

5. *Statement describing why other authorities - such as negotiated or public sale cannot be used to accomplish the economic development and job-creation goals.* A statement is provided.

6. *If a transfer is requested for less than fair market value...then a statement should be provided justifying a discount.* The applicant argues that the fair market value of the EDC parcel is less than $0 (*negative $10.2 million*), and thus does not attempt to argue for a discount from fair market value.

7. *Statement of the LRA's legal authority to acquire and dispose of the property.* A statement of legal authority is provided.

References

Administrative Draft Environmental Assessment for BRAC 95 Disposal and Reuse of the Detroit Army Tank Plant, Warren, Michigan, U.S. Army Corps of Engineers Mobile District (with technical assistance from Tetra Tech, Inc.), June 1997.

Appendix A, Zoning, Code of Ordinances, City of Warren, 1986, reprinted 1995.

City of Warren RFP 97 - Tank Plant Redevelopment Proposal, Ashley Capital (with The Cummins Group, Inc. AIA), July 30, 1997.

Detroit Arsenal Tank Plant Comprehensive Reuse Plan Final Report, City of Warren with Giffels Associates, Inc., May 2, 1997.

Detroit Arsenal Tank Plant Economic Development Conveyance Application, City of Warren, July 2, 1997.

DoD Base Reuse Implementation Manual (DoD 4165.660M), Office of the Assistant Secretary of Defense for Economic Security, 14 July 1995.

Hiffman Shaffer Associates, Inc., RFP-97-7-16, Warren Tank Plant Warren, Michigan, July 30, 1997.

Macomb County's Path to Excellence – Community of Economic Excellence, Macomb County Department of Planning and Economic Development, no date.

Proposal for the Warren Technology Park, Kojaian Management Corporation, DCT, Inc., Signature-ONCOR International, Lehman Brothers, Ghafari Associates, Inc., July 30, 1997.

Oetzel-Williams Group, Complete Appraisal, Self-contained Report of: Detroit Arsenal Tank Plant, City of Warren, Macomb County, Michigan, June 3, 1997.

Redevelopment Proposal for the Facility Formerly Known as the Detroit Arsenal Tank Plant, Commonwealth Enterprises, July 30, 1997.

RFP 97-7-16, City of Warren Request for Proposal for the Redevelopment of the Facility Formerly Known as the Detroit Arsenal Tank Plant, City of Warren, 1997, with Addenda June 13 and June 27, 1997.

Warren Policies Plan, City of Warren, September 18, 1989.

Appendix A: Engineering Analysis

Table A.1. Infrastructure divisions and systems which were evaluated for this application.

Division	*System*
Transportation	
	Roads*
	Parking lots
	Airfields
	Heliports
	Sidewalks
	Traffic signalization
Utilities - Water	
	Storm Sewer
	Sanitary Sewer and Wastewater Treatment Plant
	Domestic water
Utilities - Energy	
	Electricity
	Natural Gas
	Heating
	Cooling
Buildings	
	Demolition
	Rehabiltion
	New Construction
Miscellaneous	
	Communications
	Landscaping
	Landfills
	Industrial Waste
	Compressed Air
Public Services	
	Fire Protection
	Police

Table A.2. Buildings Survey

Bldg #	Total SF	Cat Code	Exterior Material	No. of floors
1	52,310	21000	brick	4
1	1,400	60000	brick	4
2	4,700	55010	brick	1
2	3,300	61050	brick	1
3	300	13120	brick	1
3	6,751	17120	brick	1
4	1,054,818	21000	brick	1
4	9,786	22434	brick	1
4	12,075	31010	brick	1
4	44,406	61050	brick	1
5	29,600	89121	brick	1
9	15,742	21410	concrete	1
12	30,730	17120	wood	1
14	4,520	74047	wood	1
15	4,478	61050	wood	2
18	4,800	61050	wood	2
19	4,500	72111	wood	2
21	5,000	61050	wood	2
22	4,800	61050	wood	2
23	10,800	89131	metal	1
54	3,280	21910	metal	1
55	3,920	21910	metal	1
56	5,777	21910	metal	1
57	1,680	14163	metal	1
57	1,600	44220	metal	1
58	5,090	22434	brick	1
58	45,197	44220	brick	1
59	50,958	44110	metal	1
61	2,914	21910	metal	1
63	4,044	44222	metal	1

Table A.3. Building demolition cost estimates

BUILDING DEMOLITION ESTIMATES		Minimum	Maximum
Cost to Demolish as per Appraisals and Contractors:		$3,343,382.00	$5,591,780.00
Cost to Demolish per Square foot w/o asbestos		$2.34	$3.91
Cost to Demolish per Square foot with asbestos		$3.04	$4.61
ALL Buildings Area:	**1,429,076 SF**		
Building 4 Area:	**1,121,085 SF**		
Building 4 Demo w/o asbestos removal:		$2,622,824.41	$4,386,653.11
Building 4 Demo with asbestos removal:		$3,407,583.91	$5,171,412.61
Cost to Demolish (W/O asbestos) all buildings except bldg 4:		$1,030,626.33	$1,723,714.40
Cost to Demolish (W/ asbestos) all buildings except bldg 4:		$1,338,993.83	$2,032,081.90

Table A.4. DATP Road and Parking Lots Take-Off

Section	Description	Type	Area (SF)	Volume (CY)
4	Parking	pc	21,000	746
5	Parking	mb	38,000	816
8	Parking	lb	69,600	2,541
15	Parking	ac	9,400	552
16	Parking	ac	3,000	167
18	Parking	ac	13,300	460
21	Parking	ac	3,200	117
22	Parking	pc	120,000	2,944
23	Parking	lb	2,100	104
24	Parking	lb	10,000	459
25	Parking	pc	36,000	1,033
26	Parking	mb	11,000	389
28	Parking	mb	31,500	1,178
30	Parking	pc	15,200	452
32	Parking	mb	0	22
32	Parking	mb	2,000	93
32	Parking	mb	10,400	433
33	Parking	ac	713,700	26,433
34	Parking	pc	153,700	5,607
35	Parking	pc	10,000	459
37	Parking	pcmb	38,400	814
38	Parking	pc	7,500	289
39	Parking	pc	11,250	383
41	Parking	pc	20,000	759
42	Parking	hb	25,000	926
43	Parking	lb	43,500	1,809
45	Parking	hb	15,000	599
46	Parking	hb	27,500	1,111
47	Parking	pc	2,000	74
2	Road	pc	14,580	558
7	Road	pc	49,680	1,764
9	Road	pcmb	7,650	292
10	Road	pcmb	10,450	416
11	Road	mb	17,000	677
12	Road	mb	5,270	192
13	Road	mb	2,800	108
14	Road	mb	7,020	231
15	Road	ac	9,000	136
16	Road	ac	2,520	131
17	Road	pcmb	9,120	565
19	Road	pcmb	20,700	782
20	Road	pcmb	9,400	436
26	Test track	mb	229,710	9,022
27	Road	pcmb	1,800	111
27	Road	pcmb	70,200	2,611
29	Road	pc	16,000	594
29	Road	pc	20,570	919
31	Road	pcmb	21,200	896
36	Road	pcmb	19,800	744
44	Road	bm	57,000	2,134
Total			**2,064,720**	**75,092**

Table A.5. Parking Lots: Demolition

ASPHALT

Action TO DEMOLISH	Quantity	Unit of Measure	Cost/unit	Total Cost	Means Ref. No.
Remove overlay/asphalt surface	114.244	Square Yards	$6.60	$754.013	020-554-1750
Remove 100% ballast	19.041	Cubic Yards	$0.89	$16.946	022-238-1200
Handle load into truck	38.081	Cubic Yards	$13.30	$506.484	
Haul it to the dump	38.081	Cubic Yards	$6.25	$238.009	022-266-1110
Disposal fees	38.081	Cubic Yards	$6.00	$228.489	
SUBTOTAL				**$1,743,941**	
City cost index	**105%**				
TOTAL				**$1,831,139**	
TOTAL with contingency of:	**10%**			**$2,014,252**	
TOTAL with contingency of:	**30%**			**$2,380,480**	
ROUNDED TO				**$2,014,000**	
ROUNDED TO				**$2,380,000**	

CONCRETE

Action	Quantity	Unit of Measure	Cost/unit	Total Cost	Means Ref. No.
TO REBUILT					
Remove concrete (the whole road)	48.339	SY	$11.05	$534.145	020-554-1900
Remove ballast (Est 100% of existing	4.028	Cubic Yards	$0.89	$3.585	022-238-1200
Handle load into truck	8.056	Cubic Yards	$13.30	$107.151	
Haul it to the dump	8.056	Cubic Yards	$6.25	$50.353	022-266-1110
Disposal fees	8.056	Cubic Yards	$6.00	$48.339	
SUBTOTAL				**$743,573**	
City cost index	**105%**				
TOTAL				**$780,752**	
TOTAL with contingency of:	**10%**			**$858,827**	
TOTAL with contingency of:	**30%**			**$1,014,977**	
ROUNDED TO				**$859,000**	
ROUNDED TO				**$1,015,000**	

Total Parking Cost	**Min.**	**$2,873,000**
	Max.	**$3,395,000**

Reference: RS Means - Site Work 97

Table A.6. Roads: Demolition

ASPHALT ROAD					
Action	Quantity	Unit of Measure	Cost/unit	Total Cost	Means Ref. No.
TO DEMOLISH					
Remove overlay/asphalt surface	11,179	Square Yards	$6.70	$74,899	020-554-1750
Remove 100% ballast	1,863	Cubic Yards	$0.89	$1,658	022-238-1200
Handle load into truck	3,726	Cubic Yards	$13.30	$49,560	
Haul it to the dump	3,726	Cubic Yards	$6.25	$23,289	022-266-1110
Disposal fees	3,726	Cubic Yards	$6.00	$22,358	
SUBTOTAL				**$171,764**	
City cost index	**105%**				
TOTAL				**$180,352**	
TOTAL with contingency of:	**10%**			**$198,387**	
TOTAL with contingency of:	**30%**			**$234,457**	
ROUNDED TO				**$198,000**	
ROUNDED TO				**$234,000**	

CONCRETE ROAD					
Action	Quantity	Unit of Measure	Cost/unit	Total Cost	Means Ref. No.
TO DEMOLISH					
Remove concrete (the whole road)	30,128	SY	$11.05	$332,912	020-554-1900
Remove ballast (Est 100% of existing	5,021	Cubic Yards	$0.89	$4,469	022-238-1200
Handle load into truck	10,043	Cubic Yards	$13.30	$133,566	
Haul it to the dump	10,043	Cubic Yards	$6.25	$62,766	022-266-1110
Disposal fees	10,043	Cubic Yards	$6.00	$60,256	
SUBTOTAL				**$593,969**	
City cost index	**105%**				
TOTAL				**$623,668**	
TOTAL with contingency of:	**10%**			**$686,034**	
TOTAL with contingency of:	**30%**			**$810,768**	
ROUNDED TO				**$686,000**	
ROUNDED TO				**$811,000**	

Total Roads Demolition Cost	Min	$884,000
	Max	$1,045,000

Reference: RS Means - Site Work 97

Table A.7. Test Track: Demolition

Remove existing test track and ba	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Action					
Demolition of road and soil					
Remove existing road	25,523	SY	$6.70	$171,006	020-554-1750
Remove ballast	4,254	CY	$0.89	$3,786	029-204-1400
Rubbish handling					
Rubbish handling	11,344	CY	$13.30	$150,871	020-620-3080
Haul debris to dump	11,344	CY	$12.60	$142,931	020-620-5000
Disposal fee for debris	11,344	CY	$6.00	$68,062	020-612-0320
SUBTOTAL				$536,656	
City cost index	105.2%				
TOTAL				$564,563	
TOTAL with contingency of:	10%		$56,456	$621,019	
TOTAL with contingency of:	30%		$169,369	$733,931	
ROUNDED TO				*$621,000*	
ROUNDED TO				*$734,000*	

Reference: RS Means - Site Work 97

Table A.8. Crane: Demolition

Action	Quantity	Unit of Measur	Cost/unit	Total Cost	Means Ref. No.
Remove Crane					
Remove monorail	525	LF	$26.50	$13,913	145-401-3900
SUBTOTAL				$13,913	
City cost index	105%				
TOTAL				$14,608	
TOTAL with contingency of:	10%			$16,069	
TOTAL with contingency of:	30%			$18,991	
ROUNDED TO				$16,000	
ROUNDED TO				$19,000	

Reference: RS Means - Site Work 97

Table A.9. Sidewalk, Curbs,Fence and Retaining Wall: Demolition

Remove existing test track					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Demolition of sidewalks and base					
Remove existing sidewalk	1,657	SY	$6.70	$11,104	020-554-1750
Remove ballast	184	CY	$0.89	$164	029-204-1400
Demolition of retaing wall/sound barrier					
Remove existing retaining wall/sound barrier	2,600	LF	$56.02	$145,652	020-708-3200
Rubbish handling					
Rubbish handling	882	CY	$13.30	$11,729	020-620-3080
Haul debris to dump	882	CY	$12.60	$11,112	020-620-5000
Disposal fee for debris	882	CY	$6.00	$5,291	020-612-0320
SUBTOTAL				**$185,052**	
City cost index	**105.2%**				
TOTAL				**$194,675**	
TOTAL with contingency of:	**10%**			**$214,142**	
TOTAL with contingency of:	**30%**			**$253,077**	
ROUNDED TO				***$214,000***	
ROUNDED TO				***$253,000***	

Reference: RS Means - Site Work 97

Table A.10. Landscaping: Strategy One.

Hydroseed and landscape					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
New soil					
Borrow topsoil	39,661	CY	$17.65	$700,019	022-216-7080
Haul topsoil	39,661	CY	$2.67	$105,895	022-266-0020
Spread topsoil	39,661	CY	$1.40	$55,526	022-262-0010
Hydro seed					
Hydroseed	6,425	MSF	$39.50	$253,791	029-308-1000
SUBTOTAL				**$1,115,231**	
City cost index	**105.2%**				
TOTAL				**$1,173,223**	
TOTAL with contingency of:	**10%**			**$1,290,545**	
TOTAL with contingency of:	**30%**			**$1,525,190**	
ROUNDED TO				***$1,291,000***	
ROUNDED TO				***$1,525,000***	

Reference: RS Means - Site Work 97

Table A.11. Bridge: Demolition

Remove existing bridge					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Demolition of surface					
Remove existing driving surface	1,233	SY	$6.70	$8,263	020-554-1750
Demolition of side walls					
Remove existing side walls	987	CF	$1.89	$1,865	020-708-3200
Demolition of columns and footings					
Remove existing bridge columns	64	LF	$24.00	$1,536	020-758-2160
Remove existing column footings	8	EA.	$69.20	$554	020-754-1120
Demolition of bridge girders					
Remove existing girders	2,590	LF	$37.50	$97,125	020-714-1440
Rubbish handling					
Rubbish handling	561	CY	$13.30	$7,461	020-620-3080
Haul debris to dump	561	CY	$12.60	$7,068	020-620-5000
Disposal fee for debris	561	CY	$6.00	$3,366	020-612-0320
SUBTOTAL				**$127,237**	
City cost index	**105.2%**				
TOTAL				**$133,854**	
TOTAL with contingency of:	**10%**			**$147,239**	
TOTAL with contingency of:	**30%**			**$174,010**	
ROUNDED TO				***$147,000***	
ROUNDED TO				***$174,000***	

Reference: RS Means - Site Work 97

Table A.12. Water towers: Demolition

Remove existing elevated water storage tanks					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Remove tanks					
Remove 150K elevated storage tank	2	LS	$45,000.00	$90,000	
SUBTOTAL				**$90,000**	
City cost index	**105.2%**				
TOTAL				**$94,680**	
TOTAL with contingency of:	**10%**			**$104,148**	
TOTAL with contingency of:	**30%**			**$124,031**	
ROUNDED TO				***$104,000***	
ROUNDED TO				***$124,000***	

Reference: RS Means - Site Work 97

Table A.13. Steam Tunnels: Demolition

Remove steam and condensate lines and pipe trench					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Remove pipe trench					
Excavate/backfill to remove walls	9,229	LF	$3.84	$35,439	A12.3-110-1330
Remove concrete trench walls	21,180	SF	$9.35	$198,033	020-754-2400
Remove concrete trench floor	14,120	SF	$3.98	$56,198	020-754-0400
Backfill trench	1,569	CY	$18.40	$28,868	022-276-7050
Rubbish handling					
Rubbish handling	654	CY	$13.30	$8,694	020-620-3080
Haul debris to dump	654	CY	$6.30	$4,118	020-620-5000
Disposal fee for debris	654	CY	$6.00	$3,922	020-612-0320
SUBTOTAL				$335,272	
City cost index	105%				
TOTAL				$352,706	
TOTAL with contingency of:	10%			$387,977	
TOTAL with contingency of:	30%			$458,518	
ROUNDED TO				*$388,000*	
ROUNDED TO				*$459,000*	

Reference: RS Means - Site Work 97

Table A.14. RR track and Ties: Demolition

Demolition of railroad and ties					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Demolition of railroad					
Remove existing railroad track and tie	6,874	LF	$6.70	$46,056	020-554-1750
Remove ballast	8,147	CY	$3.73	$30,388	020-554-3600
Remove switches	15	EA.	$1,875.00	$28,125	020-554-3800
Rubbish handling					
Rubbish handling	8,677	CY	$13.30	$115,409	020-620-3080
Haul debris to dump	8,677	CY	$12.60	$109,335	020-620-5000
Disposal fee for debris	8,677	CY	$6.00	$52,064	020-612-0320
SUBTOTAL				$381,377	
City cost index	105%				
TOTAL				$401,208	
TOTAL with contingency of:	10%			$441,329	
TOTAL with contingency of:	30%			$521,571	
ROUNDED TO				$441,000	
ROUNDED TO				$522,000	

Reference: RS Means - Site Work 97

Table A.15. New Road 1

Construct Road Action	Quantity	Unit of Measure	Cost/unit	Total Cost	Means Ref. No.
Build new road					
Excavate additional soil	1,778	CY	$6.75	$12,000	022-246-3060
Grade soil	5,333	SY	$0.59	$3,147	025-122-0100
Install and compact 6" crushed stone base mate	5,333	SY	$6.95	$37,067	022-300-0100
Install 3" binder course	5,333	SY	$5.30	$28,267	025-104-0160
Install 3" overlay	5,333	SY	$6.15	$32,800	025-104-0460
Compaction of 6" asphalt surface	889	CY	$0.48	$427	022-226-5020
Layout of pavement marking	4,000	L F	$0.04	$160	025-804-0790
Install pavement marking (Thermoplastic)	4,000	L F	$0.85	$3,400	025-804-0710
Install curb and gutter					
Excavation for curbs & gutters	889	CY	$4.53	$4,027	022-254-0060
Install new concrete curbs and gutters	4,000	LF	$12.10	$48,400	025-254-0435
Install new catch basins	40	Each	$700.00	$28,000	027-152-1110
Install pipe to contect catch basisns	4,000	LF	$14.70	$58,800	027-162-2200
SUBTOTAL				**$256,493**	
City cost index	**105%**				
TOTAL				**$269,318**	
TOTAL with contingency of:	**10%**			**$296,250**	
TOTAL with contingency of:	**30%**			**$350,113**	
ROUNDED TO				**$296,000**	
ROUNDED TO				**$350,000**	

Reference: RS Means - Site Work 97

Table A.16. New Road 2

Construct Road Action	Quantity	Unit of Measure	Cost/unit	Total Cost	Means Ref. No.
Build new road					
Excavate additional soil	2.151	CY	$6.75	$14.520	022-246-3060
Grade soil	6.453	SY	$0.59	$3.807	025-122-0100
Install and compact 6" crushed stone base mate	6.453	SY	$6.95	$44.851	022-300-0100
Install 3" binder course	6.453	SY	$5.30	$34.203	025-104-0160
Install 3" overlay	6.453	SY	$6.15	$39.688	025-104-0460
Compaction of 6" asphalt surface	1.076	CY	$0.48	$516	022-226-5020
Layout of pavement marking	4.840	L F	$0.04	$194	025-804-0790
Install pavement marking (Thermoplastic)	4.840	L F	$0.85	$4.114	025-804-0710
Install curb and gutter					
Excavation for curbs & gutters	1.076	CY	$4.53	$4.872	022-254-0060
Install new concrete curbs and gutters	4.840	LF	$12.10	$58.564	025-254-0435
Install new catch basins	48	Each	$700.00	$33.880	027-152-1110
Install pipe to contect catch basisns	4.840	LF	$14.70	$71.148	027-162-2200
SUBTOTAL				**$310,357**	
City cost index	105%				
TOTAL				**$325,875**	
TOTAL with contingency of:	10%			**$358,462**	
TOTAL with contingency of:	30%			**$423,637**	
ROUNDED TO				**$358,000**	
ROUNDED TO				**$424,000**	

Reference: RS Means - Site Work 97

Table A.17. New Road 3

Action	Quantity	Unit of Measure	Cost/unit	Total Cost	Means Ref. No.
Build new road					
Excavate additional soil	2.311	CY	$6.75	$15.600	022-246-3060
Grade soil	6.933	SY	$0.59	$4.091	025-122-0100
Install and compact 6" crushed stone base mate	6.933	SY	$6.95	$48.187	022-300-0100
Install 3" binder course	6.933	SY	$5.30	$36.747	025-104-0160
Install 3" overlay	6.933	SY	$6.15	$42.640	025-104-0460
Compaction of 6" asphalt surface	1.156	CY	$0.48	$555	022-226-5020
Layout of pavement marking	5.200	L F	$0.04	$208	025-804-0790
Install pavement marking (Thermoplastic)	5.200	L F	$0.85	$4.420	025-804-0710
Install curb and gutter					
Excavation for curbs & gutters	1.156	CY	$4.53	$5.235	022-254-0060
Install new concrete curbs and gutters	5.200	LF	$12.10	$62.920	025-254-0435
Install new catch basins	52	Each	$700.00	$36.400	027-152-1110
Install pipe to contect catch basisns	5.200	LF	$14.70	$76.440	027-162-2200
SUBTOTAL				$333.441	
City cost index	**105%**				
TOTAL				$350.113	
TOTAL with contingency of:	**10%**			**$385,125**	
TOTAL with contingency of:	**30%**			**$455,147**	
ROUNDED TO				$385.000	
ROUNDED TO				**$455,000**	

Reference: RS Means - Site Work 97

Table A.18. Remove existing storm sewer lines

Remove existing storm sewer lines, catch basins, and manholes					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Remove pipe					
Excavate/backfill trench	50.465	LF	$3.84	$193.784	A12.3-110-1330
Remove pipe < 12" in diameter	28.327	LF	$6.10	$172.795	020-554-2900
Remove pipe 15" to 18" in diameter	4.312	LF	$7.10	$30.615	020-554-2930
Remove pipe 21" to 24" in diameter	3.111	LF	$8.90	$27.688	020-554-2960
Remove pipe 27" to 36" in diameter	2.344	LF	$11.85	$27.776	020-554-3000
Remove pipe > 36" in diameter	4.248	LF	$11.85	$50.339	020-554-3000
Remove catch basins, manholes, etc					
Remove catch basins	354	EA	$267.00	$94.518	020-554-0020
Remove manholes	100	EA	$267.00	$26.700	020-554-0020
Remove headwalls	3	EA	$1,412.25	$4.237	A12.3-750-2000
Remove culverts	120	LF	$1.67	$200	024-164-2040
Rubbish handling					
Rubbish handling	4.445	CY	$13.30	$59.116	020-620-3080
Haul debris to dump	4.445	CY	$6.30	$28.003	020-620-5000
Disposal fee for debris	4.445	CY	$6.00	$26.669	020-612-0320
SUBTOTAL				**$742,441**	
City cost index	**105.2%**				
TOTAL				**$781,047**	
TOTAL with contingency of:	**10%**			**$859,152**	
TOTAL with contingency of:	**30%**			**$1,015,362**	
ROUNDED TO				***$859,000***	
ROUNDED TO				***$1,015,000***	

Reference: RS Means - Site Work 97

Table A.19. Remove existing sanitary sewer lines

Remove existing sanitary sewer lines and manholes					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Remove pipe					
Excavate backfill trench	7,051	LF	$3.84	$27,076	A12.3-110-1330
Remove up to 2" pipe	0	LF	$1.87	$0	020-724-2000
Remove 2" to 4" diameter pipe	637	LF	$2.49	$1,586	020-724-2050
Remove 4" to 8" diameter pipe	2,467	LF	$7.50	$18,503	020-724-2100
Remove greater then 8" diameter pipe	3,306	LF	$12.45	$41,160	020-724-2150
Remove manholes	25	EA	$267.00	$6,675	020-554-0020
Rubbish handling					
Rubbish handling	156	CY	$13.30	$2,072	020-620-3080
Haul debris to dump	156	CY	$6.30	$982	020-620-5000
Disposal fee for debris	156	CY	$6.00	$935	020-612-0320
SUBTOTAL				**$98,988**	
City cost index	**105%**				
TOTAL				**$104,136**	
TOTAL with contingency of:	**10%**			**$114,549**	
TOTAL with contingency of:	**30%**			**$135,376**	
ROUNDED TO				**$115,000**	
ROUNDED TO				**$135,000**	

Reference: RS Means - Site Work 97

Table A.20 Remove existing domestic water lines

Remove existing domestic water lines	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Action					
Remove pipe					
Excavate backfill trench	9.559	LF	$3.84	$36.707	A12.3-110-1330
Remove up to 2" pipe	1.867	LF	$1.87	$3.491	020-724-2000
Remove 2" to 4" diameter pipe	1.079	LF	$2.49	$2.687	020-724-2050
Remove 4" to 8" diameter pipe	3.001	LF	$7.50	$22.508	020-724-2100
Remove greater then 8" diameter pipe	2.743	LF	$12.45	$34.150	020-724-2150
Remove pumps and meters					
Remove 1HP pump	1	EA.	$340.00	$340	152-450-0300
Remove 3 HP pump	1	EA.	$400.00	$400	152-340-0440
Remove 5 HP pump	1	EA.	$460.00	$460	152-450-0460
Remove 10 HP pump	2	EA.	$515.00	$1.030	152-450-0500
Remove 3 meters	3	EA.	$325.00	$975	153-160-1220
Rubbish handling					
Rubbish handling	62	CY	$13.30	$828	020-620-3080
Haul debris to dump	62	CY	$6.30	$392	020-620-5000
Disposal fee for debris	62	CY	$6.00	$374	020-612-0320
SUBTOTAL				**$104,342**	
City cost index	**105.2%**				
TOTAL				**$109,768**	
TOTAL with contingency of:	**10%**		**$10,977**	**$120,744**	
TOTAL with contingency of:	**30%**		**$32,930**	**$142,698**	
ROUNDED TO				**$121,000**	
ROUNDED TO				**$143,000**	

Reference: RS Means - Site Work 97

Table A.21. Remove existing fire water lines

Remove existing fire water lines					
Action	**Quantity**	**UOM**	**Cost/unit**	**Total Cost**	**Means Ref. No.**
Remove pipe					
Excavate/backfill trench	9,840	LF	$3.84	$37,784	A12.3-110-1330
Remove 4" to 8" diameter pipe	845	LF	$7.50	$6,338	020-724-2100
Remove greater then 8" diameter pipe	8,100	LF	$12.45	$100,845	020-724-2150
Remove hydrants, values, and meters					
Remove fire hydrants and PIV's	62	EA	$159.00	$9,858	020-554-0090
Remove sectional control valves and wat	26	EA	$166.00	$4,316	026-404-3716
Remove 10 HP pump	1	EA.	$515.00	$515	152-450-0500
Remove meters	1	EA.	$325.00	$325	153-160-1220
Rubbish handling					
Rubbish handling	169	CY	$13.30	$2,242	020-620-3080
Haul debris to dump	169	CY	$6.30	$1,062	020-620-5000
Disposal fee for debris	169	CY	$6.00	$1,011	020-612-0320
SUBTOTAL				**$164,296**	
City cost index	**105.2%**				
TOTAL				**$172,839**	
TOTAL with contingency of:	**10%**		**$17,284**	**$190,123**	
TOTAL with contingency of:	**30%**		**$51,852**	**$224,691**	
ROUNDED TO				**$190,000**	
ROUNDED TO				**$225,000**	

Reference: RS Means - Site Work 97

Table A.22. Remove existing HVAC lines

Remove HVAC lines					
Action	**Quantity**	**UOM**	**Cost/unit**	**Total Cost**	**Means Ref. No.**
Remove pipe					
Remove up to 2" pipe	4,505	LF	$1.87	$8,424	020-724-2000
Remove 2" to 4" diameter pipe	3,225	LF	$2.49	$8,030	020-724-2050
Remove 4" to 8" diameter pipe	140	LF	$7.50	$1,050	020-724-2100
Remove greater then 8" diameter pipe	520	LF	$12.45	$6,474	020-724-2150
Excavate/backfill trench	400	LF	$3.84	$1,536	A12.3-110-1330
Rubbish handling					
Rubbish handling	26	CY	$13.30	$340	020-620-3080
Haul debris to dump	26	CY	$6.30	$161	020-620-5000
Disposal fee for debris	26	CY	$6.00	$154	020-612-0320
SUBTOTAL				**$26,170**	
City cost index	**105.2%**				
TOTAL				**$27,530**	
TOTAL with contingency of:	**10.0%**			**$30,283**	
TOTAL with contingency of:	**30.0%**			**$35,790**	
ROUNDED TO				**$30,000**	
ROUNDED TO				**$36,000**	

Reference: RS Means - Site Work 97

Table A.23. Natural Gas Lines: Demolition

Remove existing natural gas lines					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Remove pipe					
Excavate/backfill trench	979	LF	$3.84	$3,759	A12.3-110-1330
Remove pipe	890	LF	$7.50	$6,675	020-724-2100
Rubbish handling					
Rubbish handling	1	CY	$13.30	$10	020-620-3080
Haul debris to dump	1	CY	$6.30	$5	020-620-5000
Disposal fee for debris	1	CY	$6.00	$4	020-612-0320
SUBTOTAL				**$10,453**	
City cost index	**105.2%**				
TOTAL				**$10,996**	
TOTAL with contingency of:	**10%**		**$1,100**	**$12,096**	
TOTAL with contingency of:	**30%**		**$3,299**	**$14,295**	
ROUNDED TO				**$12,000**	
ROUNDED TO				**$14,000**	

Reference: RS Means - Site Work 97

Table A.24. Install new storm sewer lines

stall new storm sewer lines and basin					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Install Pipe					
Excavate/backfill trench	9,350	LF	$13.35	$124,823	A12.3-110-1440
Install pipe bedding	9,350	LF	$3.97	$37,120	A12.3-310-1600
Install 24" diameter concrete pipe	8,500	LF	$26.00	$221,000	027-162-2240
Install manholes					
Install manholes	20	EA	$1,535.00	$30,700	A12.3-710-5820
SUBTOTAL				**$413,642**	
City cost index	**105.2%**				
TOTAL				**$435,151**	
TOTAL with contingency of:	**10%**			**$478,667**	
TOTAL with contingency of:	**30%**			**$565,697**	
ROUNDED TO				**$479,000**	
ROUNDED TO				**$566,000**	

Reference: RS Means - Site Work 97

Table A.25. Install new sanitary sewer lines.

Install new stantiary sewer lines					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Install pipe					
Excavate/backfill trench	9.350	LF	$13.35	$124.823	A12.3-110-1440
Install pipe bedding	9.350	LF	$3.97	$37.120	A12.3-310-1600
Install 8" diameter PVC pipe	8.500	LF	$7.60	$64.600	027-168-2120
Install manholes					
Install manholes	41	EA	$1,535.00	$62.935	A12.3-710-5820
SUBTOTAL				**$289,477**	
City cost index	**105%**				
TOTAL				**$304,530**	
TOTAL with contingency of:	**10%**		**$30,453**	**$334,983**	
TOTAL with contingency of:	**30%**		**$91,358.94**	**$395,889**	
ROUNDED TO				**$335,000**	
ROUNDED TO				**$396,000**	

Reference: RS Means - Site Work 97

Table A.26. Install new water lines

Install new water lines					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Install Pipe					
Excavate/backfill trench	9.350	LF	$13.35	$124.823	A12.3-110-1440
Install pipe bedding	9.350	LF	$3.97	$37.120	A12.3-310-1600
Install 8" diameter PVC Pipe	8.500	LF	$13.30	$113.050	026-678-2210
SUBTOTAL				**$274,992**	
City cost index	**105%**				
TOTAL				**$289,292**	
TOTAL with contingency of:	**10%**			**$318,221**	
TOTAL with contingency of:	**30%**			**$376,079**	
ROUNDED TO				**$318,000**	
ROUNDED TO				**$376,000**	

Reference: RS Means - Site Work 97

Table A.27. Install new natural gas lines

Install new natural gas lines and install meters					
Action	**Quantity**	**UOM**	**Cost/unit**	**Total Cost**	**Means Ref. No.**
Install pipe					
Excavate/backfill trench	9.350	LF	$13.35	$124.823	A12.3-110-1440
Install 4" diameter pipe	9.350	LF	$17.65	$165.028	026-856-4160
SUBTOTAL				**$289,850**	
City cost index	**105%**				
TOTAL				**$304,922**	
TOTAL with contingency of:	**10%**			**$335,414**	
TOTAL with contingency of:	**30%**			**$396,399**	
ROUNDED TO				**$335,000**	
ROUNDED TO				**$396,000**	

Reference: RS Means - Site Work 97

Table A. 28. Landscaping: Strategy Two.

Hydroseed and landscape	**Quantity**	**UOM**	**Cost/unit**	**Total Cost**	**Means Ref. No.**
Action					
New soil					
Borrow topsoil	28.335	CY	$17.65	$500.118	022-216-7080
Haul topsoil	28.335	CY	$2.67	$75.655	022-266-0020
Spread topsoil	28.335	CY	$1.40	$39.669	022-262-0010
Hydro seed					
Hydroseed	2.295	MSF	$39.50	$90.659	029-308-1000
SUBTOTAL				**$706,101**	
City cost index	**105.2%**				
TOTAL				**$742,818**	
TOTAL with contingency of:	**10%**			**$817,100**	
TOTAL with contingency of:	**30%**			**$965,664**	
ROUNDED TO				***$817,000***	
ROUNDED TO				***$966,000***	

Reference: RS Means - Site Work 97

Table A.29. Install new storm sewer lines: Strategy Two

Install new storm sewer lines and basin	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Action					
Install Pipe					
Excavate/backfill trench	4,950	LF	$13.35	$66,083	A12.3-110-1440
Install pipe bedding	4,950	LF	$3.97	$19,652	A12.3-310-1600
Install 24" diameter concrete pipe	0	LF	$26.00	$0	027-162-2240
Install 30" diameter concrete pipe	4,500	LF	$33.50	$150,750	027-162-2045
Install catch basins					
Install catch basins	42	EA	$1,535	$64,470	A12.3-710-5820
Install manholes					
Install manholes	11	EA	$1,535	$16,885	A12.3-710-5820
Install infall					
Install infall headwall	1	EA	$2,600	$2,600	A12.3-750-4520
SUBTOTAL				**$320,439**	
City cost index	**105.2%**				
TOTAL				**$337,102**	
TOTAL with contingency of:	**10%**			**$370,812**	
TOTAL with contingency of:	**30%**			**$438,232**	
ROUNDED TO				**$371,000**	
ROUNDED TO				**$438,000**	

Reference: RS Means - Site Work 97

Table A.30. Install new sanitary sewer lines: Strategy Two.

Install new stantiary sewer lines					
Action	**Quantity**	**UOM**	**Cost/unit**	**Total Cost**	**Means Ref. No.**
Install pipe					
Excavate/backfill trench	5,610	LF	$13.35	$74,894	A12.3-110-1440
Install pipe bedding	5,610	LF	$3.97	$22,272	A12.3-310-1600
Install 8" diameter PVC pipe	0	LF	$5.40	$0	027-168-2080
Install 10" diameter PVC pipe	5,100	LF	$7.60	$38,760	027-168-2120
Install manholes					
Install manholes	12	EA	$1,535	$18,420	A12.3-710-5820
SUBTOTAL				**$154,345**	
City cost index	**105.2%**				
TOTAL				**$162,371**	
TOTAL with contingency of:	**10.0%**			**$178,608**	
TOTAL with contingency of:	**30.0%**			**$211,082**	
ROUNDED TO				**$179,000**	
ROUNDED TO				**$211,000**	

Reference: RS Means - Site Work 97

Table A.31. Install new water lines: Strategy Two.

Install new water lines					
Action	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Install Pipe					
Excavate backfill trench	4,950	LF	$13.35	$66,083	A12.3-110-1440
Install pipe bedding	4,950	LF	$3.97	$19,652	A12.3-310-1600
Install 8" diameter PVC Pipe	0	LF	$13.30	$0	026-678-2210
Install 12" diameter PVC Pipe	4,950	LF	$20.50	$101,475	026-678-1050
Install new fire hydrants					
Install new hydrants	40	EA	$5,000.00	$200,000	A12.3-922-3300
SUBTOTAL				$387,209	
City cost index	105%				
TOTAL				$407,344	
TOTAL with contingency of:	10%			$448,078	
TOTAL with contingency of:	30%			$529,547	
ROUNDED TO				$448,000	
ROUNDED TO				$530,000	

Reference: RS Means - Site Work 97

Table A.32. Install new natural gas lines: Strategy Two.

Install new natural gas lines	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Action					
Install pipe					
Excavate/backfill trench	4,500	LF	$13.35	$74,894	A12.3-110-1440
Install pipe bedding	4,500	LF	$3.97	$22,272	A12.3-310-1600
Install 8" diameter plastic pipe	4,500	LF	$40.50	$182,250	026-856-4280
SUBTOTAL				$279,415	
City cost index	105%				
TOTAL				$293,945	
TOTAL with contingency of:	10%			$323,339	
TOTAL with contingency of:	30%			$382,128	
ROUNDED TO				$323,000	
ROUNDED TO				$382,000	

Reference: RS Means - Site Work 97

Table A.33. Traffic signals for new roads: Strategy Two

Install new Traffic Signals	Quantity	UOM	Cost/unit	Total Cost	Means Ref. No.
Action					
Install foundations					
Excavate foundation for traffic pole	4	CY	$4.53	$18	022-254-0060
Install concrete foundation for traffic pole	4	CY	$295.00	$1.158	033-130-1520
Install lights					
Install signals programmed	1	EA	$43,200.00	$43,200	028-424-0100
Install traffic turn signals	6	EA	$2,725.00	$16,350	028-424-0120
Install fully actuated. detectors in all streets/intersection	1	EA	$7,700.00	$7,700	028-424-0300
Install pedestrian push button	9	EA	$5,825.00	$52,425	028-424-0400
Install optical programming	1	EA	$3,500.00	$3,500	028-424-0500
Paint markings					
Layout of crosswalk	600	LF	$0.04	$24	025-804-0790
Paint crosswalk (Thermoplastic paint)	600	LF	$1.17	$702	025-804-0730
Layout of directional arrows	90	SF	$4.61	$415	025-804-0760
Paint directional arrows	90	SF	$4.61	$415	025-804-0760
SUBTOTAL				**$125,907**	
City cost index	**105%**				
TOTAL				**$132,202**	
TOTAL with contingency of:	**10%**			**$145,423**	
TOTAL with contingency of:	**30%**			**$171,863**	
ROUNDED TO				***$145,000***	
ROUNDED TO				***$172,000***	

Total Cost for 2 Traffic Signals	**Min.**	**$290,000**
	Max.	**$344,000**

Reference: RS Means - Site Work 97

Distribution

Chief of Engineers 20314-1000
ATTN: CEHEC-IM-LH (2)
ATTN: CEHEC-IM-LP (2)
ATTN: CERD-L
ATTN: CERE-C (3)

U.S. Army Engineer Division,
Great Lakes & Ohio River
ATTN: CELRD 45201 (2)
ATTN: CELRL 40201 (3)

Defense Technical Info Center 22060-6218
ATTN: DTIC-O (2)

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10/97